Installation, Start-Up, and Service Instructions

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SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform the basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguishers available for all brazing operations.

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury.

⚠ CAUTION

Puron (R-410A) refrigerant systems operate at higher pressures than standard R-22 systems. Do not use R-22 service equipment or components on Puron refrigerant equipment. If service equipment is not rated for Puron refrigerant, equipment damage or personal injury may result.

⚠ WARNING

1. Improper installation, adjustment, alteration, service, or maintenance can cause property damage, personal injury, or loss of life.
2. Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

IMPORTANT: Units have high ambient operating limits. If limits are exceeded, the units will automatically lock the compressor out of operation. Manual reset will be required to restart the compressor.

INSTALLATION

Step 1 — Plan for Unit Location — Select a location for the unit and its support system (curb or other) that provides minimum clearances required for safety, unit performance and service access below, around and above unit as specified in unit drawings. Consider also the effect of adjacent units.

Do not install unit in an indoor location. Do not locate air inlets near exhaust vents or other sources of contaminated air. Although unit is weatherproof, guard against water from higher level runoff and overhangs.

Select a unit mounting system that provides adequate height to allow installation of condensate trap per requirements. Refer to Step 6 — Install External Trap for Condensate Drain for required trap dimensions.

ROOF MOUNT — Check building codes for weight distribution requirements. Unit operating weight is shown in Table 1.

Step 2 — Provide Unit Support

ROOF CURB — Assemble or install accessory roof curb in accordance with instructions shipped with this accessory. See Fig. 1. Install insulation, cant strips, roofing, and counter flashing as shown. Ductwork can be installed to roof curb before unit is set in place. Ductwork must be attached to curb and not to the unit. Curb must be level. This is necessary to permit unit drain to function properly. Unit leveling tolerance is ± 1/16 in. per linear ft in any direction. Refer to Accessory Roof Curb Installation Instructions for additional information as required. When accessory roof curb is used, unit may be installed on class A, B, or C roof covering material. Carrier roof curb accessories are for flat roofs or slab mounting.

IMPORTANT: The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket with the roof curb as shown in Fig. 1. Improperly applied gasket can also result in air leaks and poor unit performance. Do not slide unit to position on roof curb.

ALTERNATE UNIT SUPPORT — When a curb cannot be used, install unit on a noncombustible surface. Support unit with sleepers, using unit curb support area. If sleepers cannot be used, support long sides of unit with a minimum of 3 equally spaced 4-in. x 4-in. pads on each side.

Step 3 — Rig and Place Unit — Inspect unit for transportation damage. See Table 1 for physical data. File any claim with transportation agency.

⚠ CAUTION

All panels must be in place when rigging. Damage to unit may result.

Do not drop unit; keep upright. Use top crate to prevent sling or cable damage. Rollers may be used to move unit across a roof. Level by using unit rail as a reference; leveling tolerance is ± 1/16 in. per linear ft in any direction. See Fig. 2 for additional information. Unit rigging weight is shown in Fig. 2.

Rigging holes are provided in the unit base rails as shown in Fig. 2. Refer to rigging instructions on unit.

Maintain clearance, per Fig. 3, around and above unit to provide minimum distance from combustible materials, proper airflow, and service access. See Fig. 4 for location on access panels.

After unit is in position, remove crating and polyethylene sheet.

INSTALLATION ONTO CURB — The 50PG units are designed to fit on the accessory full perimeter curb. In either case, correct placement of the unit onto the curb is critical to operating performance. To aid in correct positioning, place unit on roof curb to maintain 1/4-in. gap between the inside of rail and roof curb on long sides and a 1/2-in. gap between the inside of rail and roof curb on both duct and condenser ends. Refer to Fig. 1 and 3, to assure proper duct opening alignment.

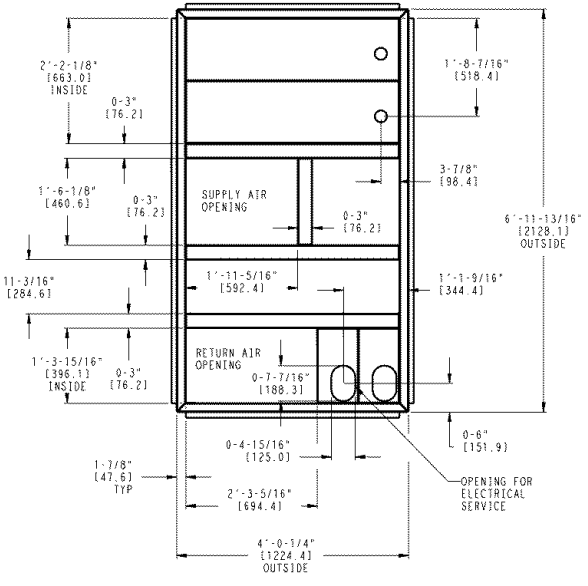
NOTE: Before positioning unit onto curb, refer to Step 6 — Install External Trap for Condensate Drain section on page 7 concerning bottom drain connection plug.

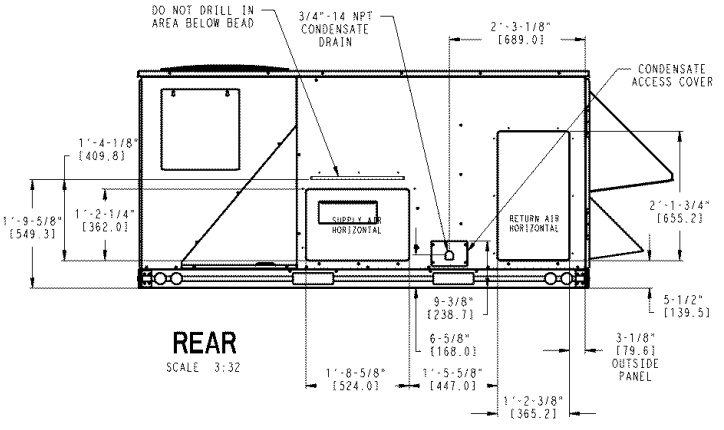
⚠ CAUTION

Do not slide unit to position it when it is sitting on the curb. Curb gasketing material may be damaged and leaks may result.

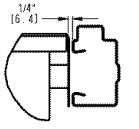
SLAB MOUNT (Horizontal Units Only) — Provide a level concrete slab that extends a minimum of 6-in. beyond unit cabinet. Install a gravel apron in front of condenser-coil air inlet to prevent grass and foliage from obstructing airflow.

NOTE: Horizontal units may also be installed on a roof curb if required.

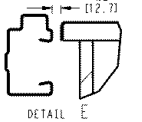




REAR
SCALE 3:32



DETAIL D
SCALE 11:32



DETAIL E
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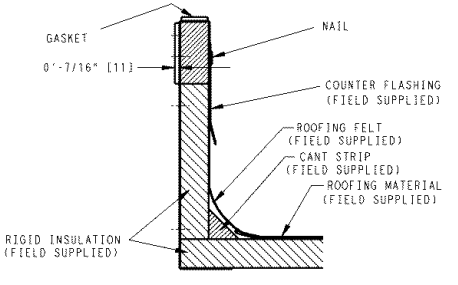
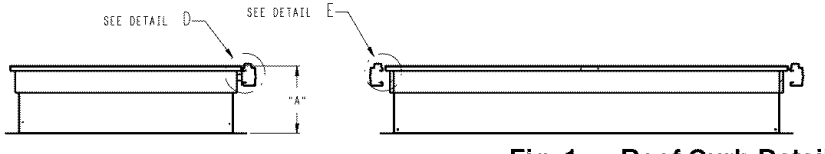
UNIT SIZE 50PG	"A"	ROOF CURB ACCESSORY
03-07	1'-2" [356] 2'-0" [610]	CRRFCURB020A00 CRRFCURB032A00

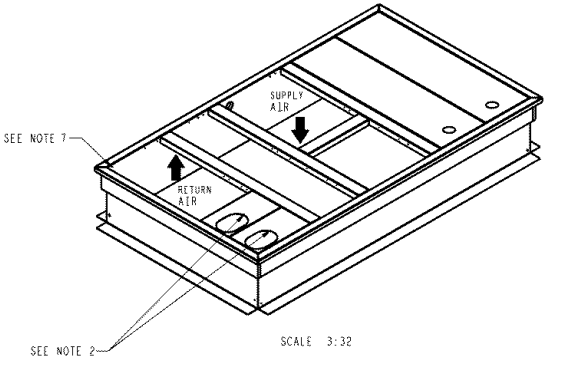
NOTES:
1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
2 INSULATED PANELS.
3 DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4 ROOF CURB GALVANIZED STEEL.
5 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
6 SERVICE CLEARANCE 4 ft ON EACH SIDE
7 BOLT HEADS TO BE ON INSIDE OF FLANGE. CLEARANCE IS [11] 0-0-7/16" TYP ALL CORNERS.

➡ DIRECTION OF AIRFLOW.



TYPICAL 4 SIDES





SCALE 3:32

Fig. 1 — Roof Curb Details

⚠ CAUTION - NOTICE TO RIGGERS:
ACCESS PANEL MUST BE IN PLACE WHEN RIGGING.

Hook rigging shackles through holes in base rail, as shown in Detail A. Holes in base rails are centered around the unit center of gravity. Use wooden top skid, when rigging, to prevent rigging straps from damaging unit.

UNIT SIZE	A		B		C		D		E		MAX. WEIGHT	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lb	kg
03-07	77.9	1978	36-54	914-1371	44.8	1139	42.0	1067	23.5	597	1125	510

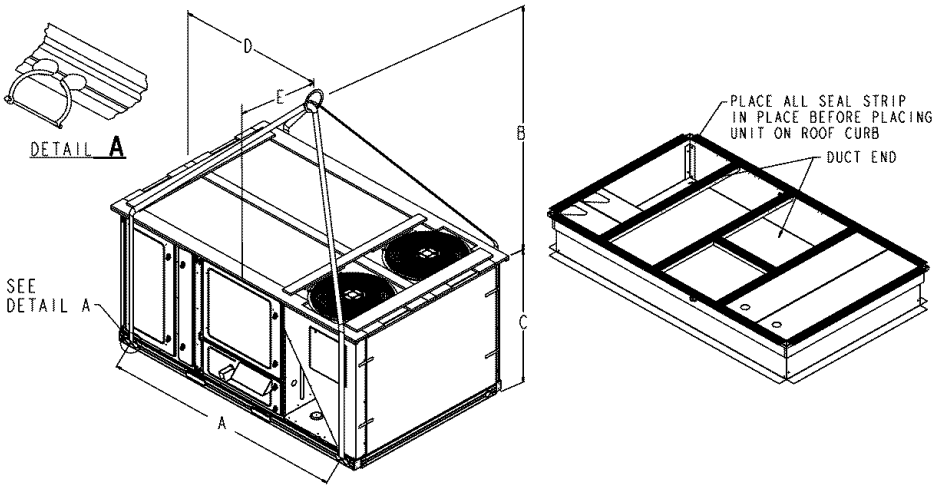


Fig. 2 — 50PG Rigging Label

Step 4 — Field Fabricate Ductwork — On vertical units, secure all ducts to roof curb and building structure. *Do not connect ductwork to unit.* For horizontal applications, field-supplied flanges should be attached to horizontal discharge openings and all ductwork secured to the flanges. Insulate and weatherproof all external ductwork, joints, and roof openings with counter flashing and mastic in accordance with applicable codes.

Ducts passing through an unconditioned space must be insulated and covered with a vapor barrier.

If a plenum return is used with a vertical unit, the return should be ducted through the roof deck to comply with applicable fire codes.

A minimum clearance is not required around ductwork. Cabinet return-air static pressure (a negative condition) shall not exceed 0.35 in. wg with economizer or 0.45 in. wg without economizer.

Step 5 — Make Unit Duct Connections

VERTICAL SUPPLY/RETURN CONFIGURATION — Unit is shipped in vertical supply/return configuration. Ductwork openings are shown in Fig. 1 and 3. Attach the ductwork to the roof curb. Do not attach duct directly to the unit.

⚠ WARNING

For vertical supply and return units, tools or parts could drop into ductwork and cause an injury. Install a 90-degree turn in the return ductwork between the unit and the conditioned space. If a 90-degree elbow cannot be installed, then a grille of sufficient strength and density should be installed to prevent objects from falling into the conditioned space.

HORIZONTAL SUPPLY/RETURN APPLICATIONS — Unit can be field-converted from vertical supply/return to horizontal supply/return. Remove all screws securing horizontal duct covers to duct panel. Save panels. Install duct covers in the vertical duct openings in the basepan with the insulation side up. Covers will drop into openings and can be secured using field-supplied self-tapping screws. Ductwork can be attached to duct flanges provided on unit. When securing ductwork to unit, do not drill in area below bead or above top edge of duct opening.

Table 1 — Physical Data

BASE UNIT 50PG		03	04	05	06	07
NOMINAL CAPACITY (Tons)		2	3	4	5	6
OPERATING WEIGHT (lb)						
Unit*		704	704	775	829	874
Economizer						
Vertical		40	40	40	40	40
Horizontal		50	50	50	50	50
Roof Curb						
14-in.		122	122	122	122	122
24-in.		184	184	184	184	184
COMPRESSOR				Fully Hermetic Scroll		
Quantity		1	1	1	1	1
Oil Type				Copeland 3MA		
Number of Refrigerant Circuits		1	1	1	1	1
Oil (oz)		38	42	42	66	56
REFRIGERANT TYPE				R-410A (Puron® Refrigerant)		
Expansion Device		TXV	TXV	TXV	TXV	TXV
Operating Charge (lb)		7.3	9.0	15.7	16.6	19.0
CONDENSER COIL				Enhanced Copper Tubes, Aluminum Lanced Fins		
Condenser A (Outer)						
Rows...Fins/in.		1...17	1...17	2...17	2...17	2...17
Face Area (sq ft)		12.6	12.6	12.6	12.6	12.6
Condenser B (Inner)						
Rows...Fins/in.		—	1...17	2...17	2...17	2...17
Face Area (sq ft)		—	12.6	12.6	12.6	12.6
CONDENSER FAN				Propeller		
Quantity...Diameter (in.)		1...24	1...24	1...24	1...24	1...24
Nominal Cfm (Total, all fans)		3500	3500	3500	4500	4500
Motor Hp		1/8	1/8	1/8	1/4	1/4
Nominal Rpm — High Speed		825	825	825	1100	1100
Nominal Rpm — Low Speed		300	300	300	300	300
EVAPORATOR COIL				Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Face Split		
Rows...Fins/in.		2...15	2...15	2...15	3...15	4...15
Face Area (sq ft)		9.3	9.3	9.3	9.3	9.3
EVAPORATOR FAN				Centrifugal Type, Belt Drive		
Quantity...Size (in.)	Low	1...12 x 9	1...12 x 9	1...12 x 9	1...12 x 9	1...12 x 9
	High	1...12 x 9	1...12 x 9	1...12 x 9	1...12 x 9	1...12 x 9
Type Drive	Low	Belt	Belt	Belt	Belt	Belt
	High	Belt	Belt	Belt	Belt	Belt
Nominal Cfm		800	1200	1600	2000	2400
Maximum Continuous Bhp	Low	0.85	0.85	0.85	0.85/2.40†	2.40
	High	0.85	0.85	1.60/2.40†	1.60/2.40†	3.10
Motor Nominal Rpm		1620	1620	1620	1725	1725
Motor Frame Size	Low	48Y	48Y	48Y	56Y	56Y
	High	48Y	48Y	56Y	56Y	56Y
Fan Rpm Range	Low	482-736	482-736	596-910	690-978	796-1128
	High	656-1001	796-1128	828-1173	929-1261	1150-1438
Motor Bearing Type		Ball	Ball	Ball	Ball	Ball
Maximum Fan Rpm		2000	2000	2000	2000	2000
Motor Pulley Pitch Diameter Range (in.)	Low	1.9-2.9	1.9-2.9	1.9-2.9	2.4-3.4	2.4-3.4
	High	1.9-2.9	2.4-3.4	2.4-3.4	2.8-3.8	4.0-5.0
Fan Pulley Pitch Diameter (in.)	Low	6.8	6.8	5.5	6.0	5.2
	High	5.0	5.2	5.0	5.2	6.0
Nominal Motor Shaft Diameter (in.)	Low	1/2	1/2	1/2	5/8	5/8
	High	1/2	1/2	5/8	5/8	7/8
Belt...Pitch Length (in.)	Low	49.3	49.3	49.3	49.3	49.3
	High	49.3	49.3	49.3	49.3	52.3
Belt...Type	Low	AX	AX	AX	AX	AX
	High	AX	AX	AX	AX	AX
Pulley Center Line Distance Min. (in.)	Low	16.2	16.2	16.2	16.2	16.2
	High	16.2	16.2	16.2	16.2	16.2
Pulley Center Line Distance Max. (in.)	Low	20.2	20.2	20.2	20.2	20.2
	High	20.2	20.2	20.2	20.2	20.2
Speed Change per Full Turn of	Low	48	48	59	58	66
Movable Pulley Flange (rpm)	High	65	62	69	66	58
Movable Pulley Maximum Full	Low	5	5	5	5	5
Turns from Closed Position	High	5	5	5	5	5
Factory Pulley Setting (rpm)	Low	482	482	596	690	796
	High	656	796	828	929	1150
Fan Shaft Diameter at Pulley (in.)		3/4	3/4	3/4	3/4	3/4
HIGH-PRESSURE SWITCH (psig)						
Cutout		660 ± 10	660 ± 10	660 ± 10	660 ± 10	660 ± 10
Reset (Auto.)		505 ± 20	505 ± 20	505 ± 20	505 ± 20	505 ± 20
LOW-PRESSURE SWITCH (psig)						
Cutout		40 ± 7	40 ± 7	40 ± 7	40 ± 7	40 ± 7
Reset (Auto.)		80 ± 7	80 ± 7	80 ± 7	80 ± 7	80 ± 7
FREEZE PROTECTION THERMOSTAT (F)						
Cutout		30 ± 5	30 ± 5	30 ± 5	30 ± 5	30 ± 5
Reset (Auto.)		45 ± 5	45 ± 5	45 ± 5	45 ± 5	45 ± 5
RETURN-AIR FILTERS				Throwaway		
Quantity...Size (in.)		4...16 x 20 x 2	4...16 x 20 x 2	4...16 x 20 x 2	4...16 x 20 x 2	4...16 x 20 x 2

LEGEND

TXV — Thermostatic Expansion Valve

*Aluminum evaporator coil/aluminum condenser coil.
†Single phase/three phase.

NOTES:

1. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY.
3. DIRECTION OF AIR FLOW.
4. ON VERTICAL DISCHARGE UNITS, DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY. FOR HORIZONTAL DISCHARGE UNITS FIELD SUPPLIED FLANGES SHOULD BE ATTACHED TO HORIZONTAL DISCHARGE OPENINGS, AND ALL DUCTWORK SHOULD BE ATTACHED TO THE FLANGES.
5. MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
   a. ON VERTICAL DISCHARGE UNITS, CLEARANCE TO COMBUSTIBLE FOR FIRST 12" OF DUCT TUBE 1"
   b. BOTTOM OF UNIT TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 1 INCH.
      BOTTOM OF BASE RAIL TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 0 INCHES.
   c. CONDENSER COIL. FOR PROPER AIR FLOW, 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
   d. OVERHEAD, 60 INCHES TO ASSURE PROPER CONDENSER FAN OPERATION.
   e. BETWEEN UNITS, CONTROL BOX SIDE, 42 IN. PER NEC.
   f. BETWEEN UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE, 36 IN. PER NEC.
   g. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN. PER NEC.
   h. HORIZONTAL SUPPLY AND RETURN END, 0 INCHES.
6. WITH THE EXCEPTION OF THE CLEARANCE FOR THE CONDENSER COIL, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
7. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL IF SET ON BASE RAIL.
8. THE VERTICAL CENTER OF GRAVITY IS 1'-6"[457] UP FROM FROM THE BOTTOM OF THE BASE RAIL.

UNIT	STD. UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)	
	LB	KG	LB	KG	LB	KG	LB	KG	LB	KG
50PG03	704	319	162	73	142	64	187	85	214	97
50PG04	704	319	162	73	142	64	187	85	214	97
50PG05	775	352	178	81	156	71	206	93	235	107
50PG06	829	376	191	86	167	76	220	100	252	114
50PG07	874	396	201	91	176	80	232	105	265	120

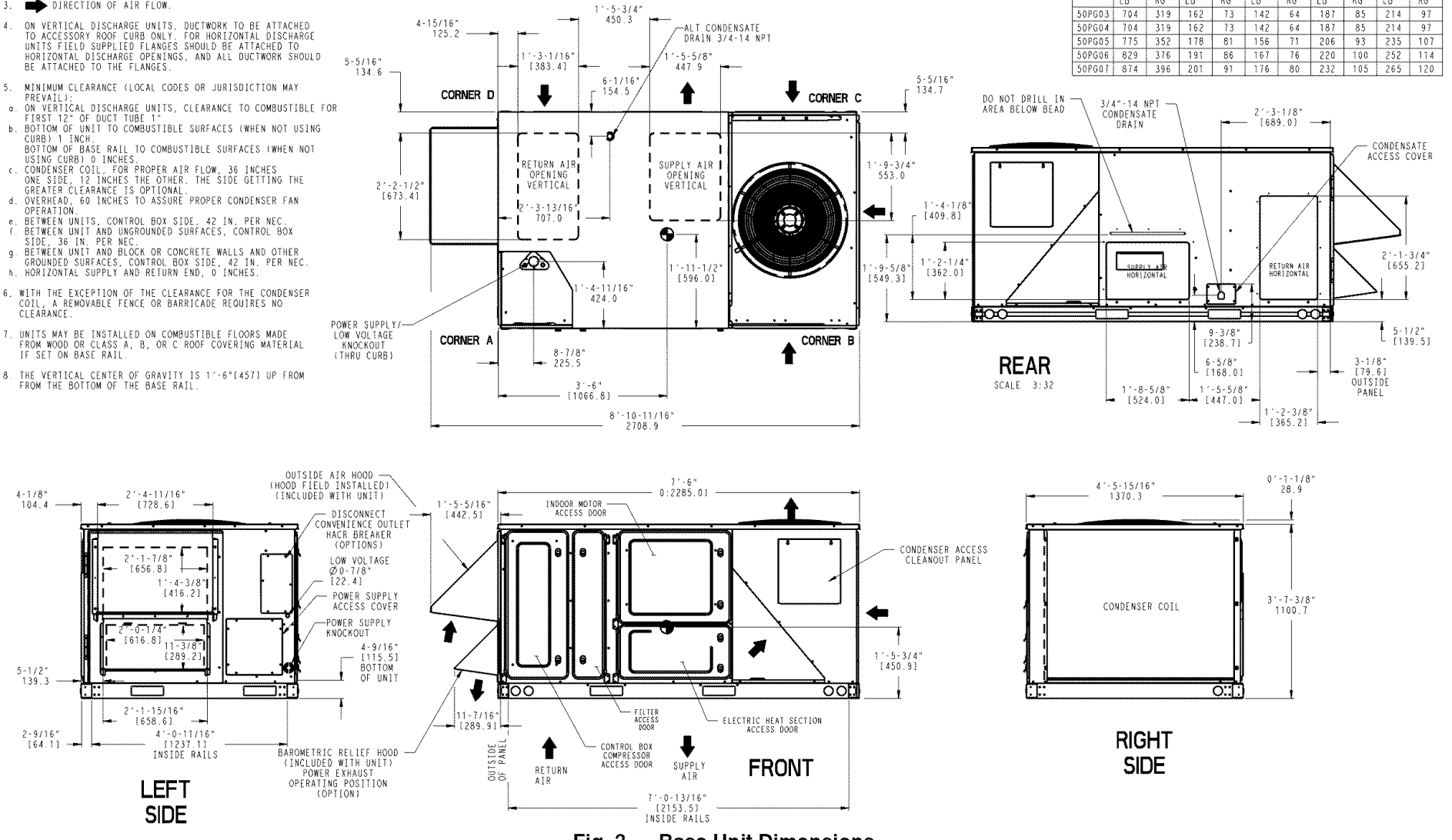


Fig. 3 — Base Unit Dimensions

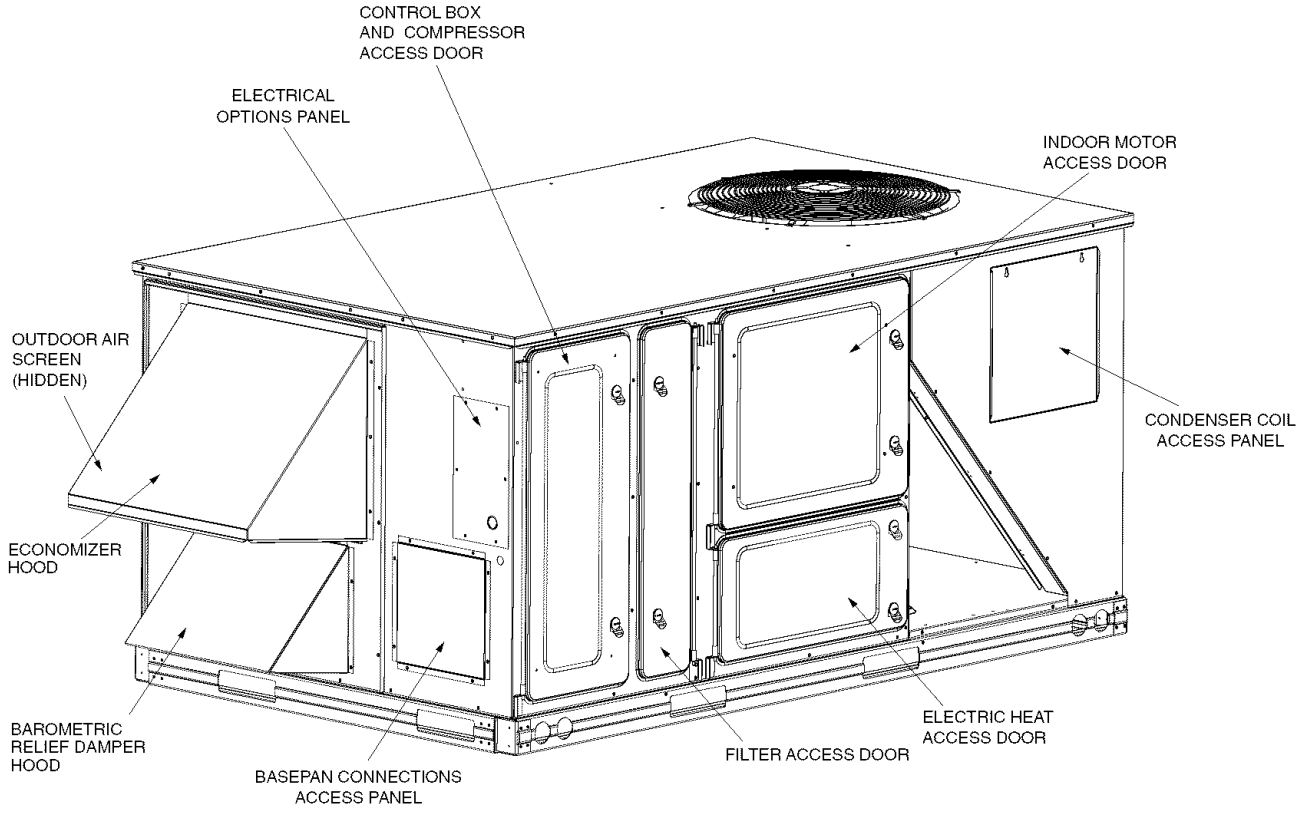


Fig. 4 — Panel and Filter Locations

Step 6 — Install External Trap for Condensate Drain

The unit's $^3/_4$-in. condensate drain connections are located on the bottom and side of the unit. Unit discharge connections do not determine the use of drain connections; either drain connection can be used with vertical or horizontal applications. See Fig. 3 for locations.

When using the standard side drain connection, make sure the plug (red) in the alternate bottom connection is tight before installing the unit. See Fig. 5.

To use the bottom drain connection for a roof curb installation, relocate the factory-installed plug (red) from the bottom connection to the side connection. A $^1/_2$-in. socket extension can be used to remove the plug. See Fig. 5. The piping for the condensate drain and external trap can be completed after the unit is in place.

All units must have an external trap for condensate drainage. Install a trap at least 4-in. deep and protect against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the unit at 1-in. per 10 ft of run. Do not use a pipe size smaller than the unit connection ($^3/_4$-in.). See Fig. 6 and 7.

The 50PG units are provided with a removable condensate pan for ease of cleaning. It is recommended that a union be placed between the unit and condensate drainage to ease the removal of the pan during servicing. Adequate clearance should be allowed if removal of condensate pan is required. Allow 54 in. between condensate pan access panel and any obstruction for complete removal.

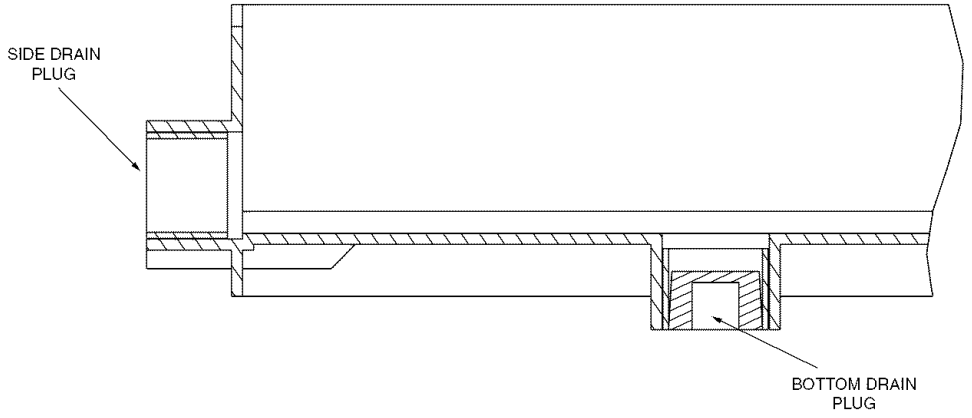


Fig. 5 — Condensate Drain Pan

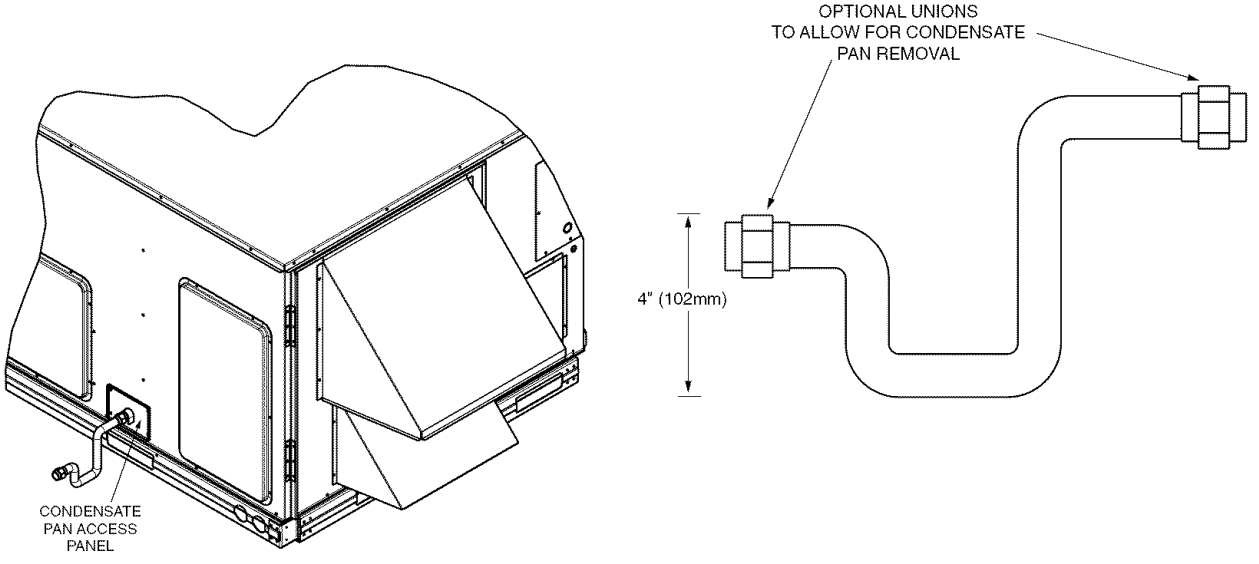
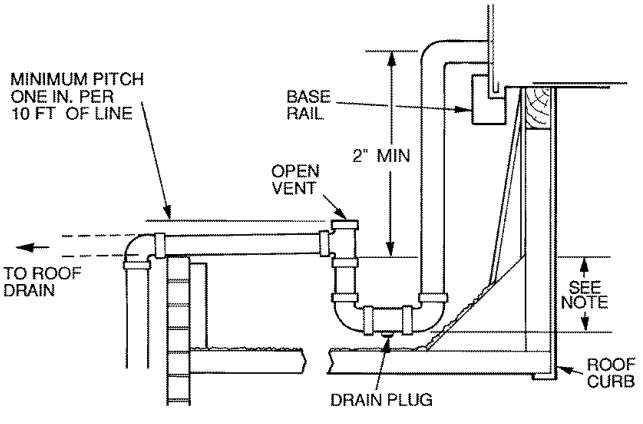


Fig. 6 — External Trap for Condensate Drain



NOTE: Trap should be deep enough to offset maximum unit static difference. A 4-in. trap is recommended.

Fig. 7 — Condensate Drain Piping Details

Step 7 — Make Electrical Connections

FIELD POWER SUPPLY — All 208/230-v units are factory wired for 230-v power supply. If the 208/230-v unit is to be connected to a 208-v power supply, the transformer must be rewired by moving the black wire with the 1/4-in. female quick connect from the 230-volt connection and moving to the 200-volt 1/4-in. male terminal on the primary side of the transformer.

Refer to unit label diagram for additional information.

All field wiring must comply with NEC (National Electrical Code) and local codes. Size wire based on MCA (Minimum Circuit Amps) on the unit informative plate. Leads are provided for field wire connections. Use UL (Underwriters' Laboratories) approved copper/aluminum connector.

When installing units, provide safety disconnect per NEC Article 440 or local codes. For non-fused disconnects, size the disconnect according to the sizing data provided in the electrical data tables. If a fused disconnect is used, determine the minimum size for the switch based on the disconnect sizing data provided in the electrical data tables and then coordinate the disconnect housing size to accommodate the Maximum Overcurrent Protection (MOCP) device size as marked on the unit informative plate. See Tables 2A and 2B.

See Fig. 8 for power wiring connection to unit leads and equipment ground.

Route power and ground lines through control box end panel or unit basepan (see Fig. 3) to connections as shown on unit wiring diagram and Fig. 8. Make sure that there is a watertight seal when penetrating the cabinet. Factory leads may be wired directly to the disconnect.

⚠ CAUTION

The correct power phasing is critical to the operation of the scroll compressors. An incorrect phasing will result in an alarm being generated and compressor operation lockout. Should this occur, power phase correction must be made to the incoming power. Damage to compressor could result.

⚠ WARNING

Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC; ANSI/NFPA (American National Standards Institute/National Fire Protection Association), latest edition, and local electrical codes. Failure to follow this warning could result in the installer being liable for personal injury of others.

Field wiring must conform to temperature limitations for type "T" wire. All field wiring must comply with NEC and local requirements.

Operating voltage to compressor must be within voltage range indicated on unit nameplate. On 3-phase units, voltages between phases must be balanced within 2%.

Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components.

FIELD CONTROL WIRING — Unit can be controlled with a Carrier-approved accessory thermostat. Install thermostat according to the installation instructions included with accessory. Locate thermostat assembly on a solid interior wall in the conditioned space to sense average temperature.

Route thermostat cable or equivalent single leads of colored wire from subbase terminals through conduit into unit to low-voltage connections as shown on unit label wiring diagram and in Fig. 9.

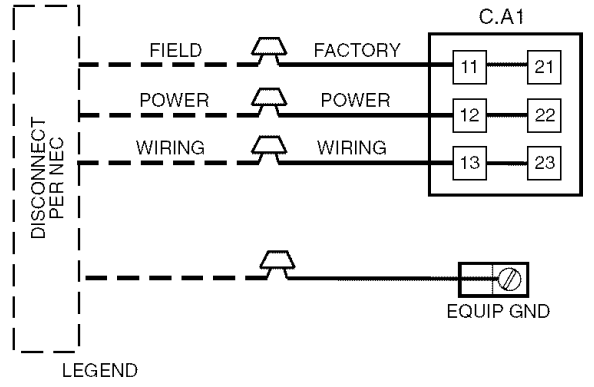
If bottom entry is used, seal the hole in the grommet of the control box with RTV sealant.

NOTE: For wire runs up to 50 ft, use no. 18 AWG (American Wire Gage) insulated wire (35 C minimum). For 50 to 75 ft, use no. 16 AWG insulated wire (35 C minimum). For over 75 ft, use no. 14 AWG insulated wire (35 C Minimum). All wire larger than no. 18 AWG cannot be directly connected at the thermostat and will require a junction box and splice at the thermostat.

Set heat anticipator settings as follows:

VOLTAGE	STAGE 1 (W1) ON	STAGE 1 AND 2 (W1 AND W2) ON
All	0.2	0.4

Settings may be changed slightly to provide a greater degree of comfort for a particular installation.



NOTE: The maximum wire size for C.A1 is 2/0.

Fig. 8 — Field Power Wiring Connections

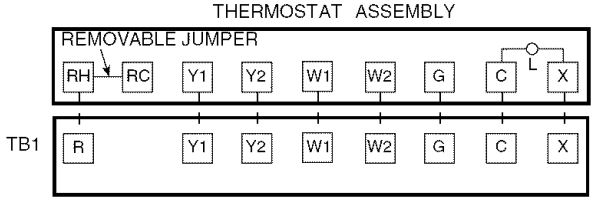


Fig. 9 — Field Control Thermostat Wiring

Table 2A — Electrical Data — Units Without Optional Convenience Outlet

UNIT 50PG	NOMINAL POWER SUPPLY Volts-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA		IFM FLA	POWER EXHAUST FLA (ea)	IFM TYPE	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				FLA	Nominal kW*	MCA	MOCP†	FLA	LRA
03	208/230-1-60	187	253	12.8	60	1	1.0	4.9	—	STD	—	—	21.9/21.9	25/25	22/22	74/74
											10.8/12.5	2.3/ 3.0	21.9/21.9	25/25	22/22	74/74
											17.3/20.0	3.8/ 5.0	27.8/31.1	30/35	26/29	74/74
											26.0/30.0	5.6/ 7.5	38.6/43.6	40/45	36/40	74/74
											34.7/40.0	7.5/10.0	49.5/56.1	50/60	46/52	74/74
										ALT	—	—	21.9/21.9	25/25	22/22	74/74
											10.8/12.5	2.3/ 3.0	21.9/21.9	25/25	22/22	74/74
											17.3/20.0	3.8/ 5.0	27.8/31.1	30/35	26/29	74/74
											26.0/30.0	5.6/ 7.5	38.6/43.6	40/45	36/40	74/74
											34.7/40.0	7.5/10.0	49.5/56.1	50/60	46/52	74/74
									1.4	STD	—	—	23.3/23.3	25/25	23/23	76/76
											10.8/12.5	2.3/ 3.0	23.3/23.5	25/25	23/23	76/76
											17.3/20.0	3.8/ 5.0	29.5/32.9	30/35	27/30	76/76
											26.0/30.0	5.6/ 7.5	40.4/45.4	45/50	37/42	76/76
											34.7/40.0	7.5/10.0	51.3/57.9	60/60	47/53	76/76
										ALT	—	—	23.3/23.3	25/25	23/23	76/76
											10.8/12.5	2.3/ 3.0	23.3/23.5	25/25	23/23	76/76
											17.3/20.0	3.8/ 5.0	29.5/32.9	30/35	27/30	76/76
											26.0/30.0	5.6/ 7.5	40.4/45.4	45/50	37/42	76/76
											34.7/40.0	7.5/10.0	51.3/57.9	60/60	47/53	76/76
04	208/230-1-60	187	253	15.4	83	1	1.0	4.9	—	STD	—	—	25.2/25.2	30/30	24/24	97/97
											10.8/12.5	2.3/ 3.0	25.2/25.2	30/30	24/24	97/97
											17.3/20.0	3.8/ 5.0	27.8/31.1	30/35	26/29	97/97
											26.0/30.0	5.6/ 7.5	38.6/43.6	40/45	36/40	97/97
											34.7/40.0	7.5/10.0	49.5/56.1	50/60	46/52	97/97
											52.0/60.0	11.3/15.0	71.1/81.1	80/90	65/75	97/97
										ALT	—	—	25.2/25.2	30/30	24/24	97/97
											10.8/12.5	2.3/ 3.0	25.2/25.2	30/30	24/24	97/97
											17.3/20.0	3.8/ 5.0	27.8/31.1	30/35	26/29	97/97
											26.0/30.0	5.6/ 7.5	38.6/43.6	40/45	36/40	97/97
											34.7/40.0	7.5/10.0	49.5/56.1	50/60	46/52	97/97
											52.0/60.0	11.3/15.0	71.1/81.1	80/90	65/75	97/97
									1.4	STD	—	—	26.6/26.6	30/30	26/26	99/99
											10.8/12.5	2.3/ 3.0	26.6/26.6	30/30	26/26	99/99
											17.3/20.0	3.8/ 5.0	29.5/32.9	30/35	27/30	99/99
											26.0/30.0	5.6/ 7.5	40.4/45.4	45/50	37/42	99/99
											34.7/40.0	7.5/10.0	51.3/57.9	60/60	47/53	99/99
											52.0/60.0	11.3/15.0	72.9/82.9	80/90	67/76	99/99
										ALT	—	—	26.6/26.6	30/30	26/26	99/99
											10.8/12.5	2.3/ 3.0	26.6/26.6	30/30	26/26	99/99
											17.3/20.0	3.8/ 5.0	29.5/32.9	30/35	27/30	99/99
											26.0/30.0	5.6/ 7.5	40.4/45.4	45/50	37/42	99/99
											34.7/40.0	7.5/10.0	51.3/57.9	60/60	47/53	99/99
											52.0/60.0	11.3/15.0	72.9/82.9	80/90	67/76	99/99

LEGEND

FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
OFM — Outdoor (Condenser) Fan Motor
RLA — Rated Load Amps

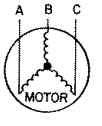
*Heater capacity (kW) is based on heater voltage of 208 v, 240 v, 480 v or 600 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

   $$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 230-3-60.



AB = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{224 + 231 + 226}{3}$$

$$= \frac{681}{3}$$

$$= 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{4}{227}$$

$$= 1.76\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact the local electric utility company immediately.

Table 2A — Electrical Data — Units Without Optional Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY Volts-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA		IFM FLA	POWER EXHAUST FLA (ea)	IFM TYPE	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				FLA	Nominal kW*	MCA	MOCP†	FLA	LRA
04 (cont)	208/230-3-60	187	253	11.5	77	1	1.0	4.9	—	STD	— 6.3/ 7.2 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6	— 2.3/ 3.0 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0	20.3/20.3 20.3/20.3 20.3/20.5 24.9/27.8 31.1/35.0 43.6/49.4	25/25 25/25 25/25 25/30 35/40 45/50	20/20 20/20 20/20 23/26 29/32 40/45	91/91 91/91 91/91 91/91 91/91 91/91
										ALT	— 6.3/ 7.2 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6	— 2.3/ 3.0 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0	20.3/20.3 20.3/20.3 20.3/20.5 24.9/27.8 31.1/35.0 43.6/49.4	25/25 25/25 25/25 25/30 35/40 45/50	20/20 20/20 20/20 23/26 29/32 40/45	91/91 91/91 91/91 91/91 91/91 91/91
									1.4	STD	— 6.3/ 7.2 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6	— 2.3/ 3.0 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0	21.7/21.7 21.7/21.7 21.7/22.3 26.6/29.5 32.9/36.8 45.4/51.1	25/25 25/25 25/25 30/30 35/40 50/60	22/22 22/22 22/22 24/27 30/34 42/47	93/93 93/93 93/93 93/93 93/93 93/93
										ALT	— 6.3/ 7.2 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6	— 2.3/ 3.0 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0	21.7/21.7 21.7/21.7 21.7/22.3 26.6/29.5 32.9/36.8 45.4/51.1	25/25 25/25 25/25 30/30 35/40 50/60	22/22 22/22 22/22 24/27 30/34 42/47	93/93 93/93 93/93 93/93 93/93 93/93
	460-3-60	414	506	5.1	35	1	0.5	2.1	—	STD	— 3.5 5.8 8.7 11.5 17.3	— 3.0 5.0 7.5 10.0 15.0	9.0 9.0 9.9 13.5 17.0 24.3	15 15 15 15 20 25	9 9 9 12 16 22	42 42 42 42 42 42
										ALT	— 3.5 5.8 8.7 11.5 17.3	— 3.0 5.0 7.5 10.0 15.0	9.0 9.0 9.9 13.5 17.0 24.3	15 15 15 15 20 25	9 9 9 12 16 22	42 42 42 42 42 42
									0.6	STD	— 3.5 5.8 8.7 11.5 17.3	— 3.0 5.0 7.5 10.0 15.0	9.6 9.6 10.6 14.3 17.8 25.0	15 15 15 15 20 30	10 10 10 13 16 23	43 43 43 43 43 43
										ALT	— 3.5 5.8 8.7 11.5 17.3	— 3.0 5.0 7.5 10.0 15.0	9.6 9.6 10.6 14.3 17.8 25.0	15 15 15 15 20 30	10 10 10 13 16 23	43 43 43 43 43 43
	575-3-60	518	633	4.3	31	1	0.5	2.1	—	STD	— 9.2 13.9	— 10.0 15.0	8.0 14.1 20.0	15 15 25	8 13 18	37 37 37
										ALT	— 9.2 13.9	— 10.0 15.0	8.0 14.1 20.0	15 15 25	8 13 18	37 37 37
									1.4	STD	— 9.2 13.9	— 10.0 15.0	9.4 15.9 21.8	15 20 25	10 15 20	39 39 39
										ALT	— 9.2 13.9	— 10.0 15.0	9.4 15.9 21.8	15 20 25	10 15 20	39 39 39
05	208/230-1-60	187	253	20.5	109	1	1.0	4.9	—	STD	— 17.3/20.0 26.0/30.0 34.7/40.0 52.0/60.0 69.3/80.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0	31.5/ 31.5 31.5/ 31.5 38.6/ 43.6 49.5/ 56.1 71.1/ 81.1 92.8/106.1	35/ 35 35/ 35 40/ 45 50/ 60 80 /90 100/110	30/30 30/30 36/40 46/52 65/75 85/98	123/123 123/123 123/123 123/123 123/123 123/123
								7.0	—	ALT	— 17.3/20.0 26.0/30.0 34.7/40.0 52.0/60.0 69.3/80.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0	33.6/ 33.6 33.6/ 33.8 41.3/ 46.3 52.1/ 58.8 73.8/ 83.8 95.4/108.8	35/ 35 35/ 35 45/ 50 60/ 60 80/ 90 100/110	33/ 33 33/ 33 38/ 43 48/ 54 68/ 77 88/100	148/148 148/148 148/148 148/148 148/148 148/148
								4.9	1.4	STD	— 17.3/20.0 26.0/30.0 34.7/40.0 52.0/60.0 69.3/80.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0	32.9/ 32.9 32.9/ 32.9 40.4/ 45.4 51.3/ 57.9 72.9/ 82.9 94.5/107.9	35/ 35 35/ 35 45/ 50 60/ 60 80/ 90 100/110	32/32 32/32 37/42 47/53 67/76 87/99	125/125 125/125 125/125 125/125 125/125 125/125
								7.0	1.4	ALT	— 17.3/20.0 26.0/30.0 34.7/40.0 52.0/60.0 69.3/80.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0	35.0/ 35.5 35.0/ 35.5 43.0/ 48.0 53.9/ 60.5 75.5/ 85.5 97.1/110.5	40/ 40 40/ 40 45/ 50 60/ 70 80/ 90 100/125	34/ 34 34/ 34 40/ 44 50/ 56 69/ 79 89/102	150/150 150/150 150/150 150/150 150/150 150/150

Table 2A — Electrical Data — Units Without Optional Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY Volts-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA		IFM FLA	POWER EXHAUST FLA (ea)	IFM TYPE	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				FLA	Nominal kW*	MCA	MOCP†	FLA	LRA
05 (cont)	208/230-3-60	187	253	14.6	91	1	1.0	4.9	—	STD	—	—	24.2/24.2	25/25	24/24	105/105
											10.0/11.5	3.8/ 5.0	24.2/24.2	25/25	24/24	105/105
											15.0/17.3	5.6/ 7.5	24.9/27.8	25/30	24/26	105/105
											20.0/23.1	7.5/10.0	31.1/35.0	35/40	29/32	105/105
											30.0/34.6	11.3/15.0	43.6/49.4	45/50	40/45	105/105
											40.0/46.2	15.0/20.0	56.1/63.9	60/70	52/59	105/105
								5.2	—	ALT	—	—	24.5/24.5	25/25	24/24	123/123
											10.0/11.5	3.8/ 5.0	24.5/24.5	25/25	24/24	123/123
											15.0/17.3	5.6/ 7.5	25.3/28.1	30/30	24/26	123/123
											20.0/23.1	7.5/10.0	31.5/35.4	35/40	29/33	123/123
											30.0/34.6	11.3/15.0	44.0/49.8	45/50	40/46	123/123
											40.0/46.2	15.0/20.0	56.5/64.3	60/70	52/59	123/123
								4.9	1.4	STD	—	—	25.6/25.6	30/30	25/25	107/107
											10.0/11.5	3.8/ 5.0	25.6/25.6	30/30	25/25	107/107
											15.0/17.3	5.6/ 7.5	26.6/29.5	30/30	25/27	107/107
											20.0/23.1	7.5/10.0	32.9/36.8	35/40	30/34	107/107
											30.0/34.6	11.3/15.0	45.4/51.1	50/60	42/47	107/107
											40.0/46.2	15.0/20.0	57.9/65.6	60/70	53/60	107/107
								5.2	1.4	ALT	—	—	25.9/25.9	30/30	26/26	125/125
											10.0/11.5	3.8/ 5.0	25.9/25.9	30/30	26/26	125/125
											15.0/17.3	5.6/ 7.5	27.0/29.9	30/30	26/27	125/125
											20.0/23.1	7.5/10.0	33.3/37.1	35/40	31/34	125/125
											30.0/34.6	11.3/15.0	45.8/51.5	50/60	42/47	125/125
											40.0/46.2	15.0/20.0	58.3/66.0	60/70	54/61	125/125
	460-3-60	414	506	7.1	46	1	0.5	2.1	—	STD	—	—	11.5	15	11	53
											5.8	5.0	11.5	15	11	53
											8.7	7.5	13.5	15	12	53
											11.5	10.0	17.0	20	16	53
											17.3	15.0	24.3	25	22	53
											23.1	20.0	31.5	35	29	53
								2.6	—	ALT	—	—	12.0	15	12	62
											5.8	5.0	12.0	15	12	62
											8.7	7.5	14.1	15	13	62
											11.5	10.0	17.6	20	16	62
											17.3	15.0	24.9	25	23	62
											23.1	20.0	32.1	35	30	62
								2.1	0.6	STD	—	—	12.1	15	12	54
											5.8	5.0	12.1	15	12	54
											8.7	7.5	14.3	15	13	54
											11.5	10.0	17.8	20	16	54
											17.3	15.0	25.0	30	23	54
											23.1	20.0	32.3	35	30	54
								2.6	0.6	ALT	—	—	12.6	15	12	63
											5.8	5.0	12.6	15	12	63
											8.7	7.5	14.9	15	14	63
											11.5	10.0	18.4	20	17	63
											17.3	15.0	25.6	30	24	63
											23.1	20.0	32.9	35	30	63
	575-3-60	518	633	5.1	34	1	0.5	2.1	—	STD	—	—	9.0	15	9	40
											9.2	10.0	14.1	15	13	40
											13.9	15.0	20.0	25	18	40
											18.5	20.0	25.8	30	24	40
								2.0	—	ALT	—	—	8.9	15	9	46
											9.2	10.0	14.0	15	13	46
											13.9	15.0	19.9	20	18	46
											18.5	20.0	25.6	30	24	46
								2.1	1.4	STD	—	—	10.4	15	10	42
											9.2	10.0	15.9	20	15	42
											13.9	15.0	21.8	25	20	42
											18.5	20.0	27.5	30	25	42
								2.0	1.4	ALT	—	—	10.3	15	10	48
											9.2	10.0	15.8	20	14	48
											13.9	15.0	21.6	25	20	48
											18.5	20.0	27.4	30	25	48

LEGEND

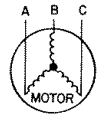
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
OFM — Outdoor (Condenser) Fan Motor
RLA — Rated Load Amps

*Heater capacity (kW) is based on heater voltage of 208 v, 240 v, 480 v or 600 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance
   $= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$

Example: Supply voltage is 230-3-60.



AB = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{224 + 231 + 226}{3} = \frac{681}{3} = 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{4}{227} = 1.76\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact the local electric utility company immediately.

Table 2A — Electrical Data — Units Without Optional Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY Volts-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA		IFM FLA	POWER EXHAUST FLA (ea)	IFM TYPE	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				FLA	Nominal kW*	MCA	MOCP†	FLA	LRA
06	208/230-1-60	187	253	26.9	145	1	1.5	4.9	—	STD	— 17.3/ 20.0 26.0/ 30.0 34.7/ 40.0 52.0/ 60.0 69.3/ 80.0 86.7/100.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	40.0/ 40.0 40.0/ 40.0 40.0/ 43.6 49.5/ 56.1 71.1/ 81.1 92.8/106.1 114.5/131.1	45/ 45 45/ 45 45/ 45 50/ 60 80/ 90 100/110 125/150	38/ 38 38/ 38 38/ 40 46/ 52 65/ 75 85/ 98 105/121	160/160 160/160 160/160 160/160 160/160 160/160 160/160
								7.0	—	ALT	— 17.3/ 20.0 26.0/ 30.0 34.7/ 40.0 52.0/ 60.0 69.3/ 80.0 86.7/100.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	42.1/ 42.1 42.1/ 42.1 42.1/ 46.3 52.1/ 58.8 73.8/ 83.8 95.4/108.8 117.1/133.8	45/ 45 45/ 45 45/ 50 60/ 60 80/ 90 100/110 125/150	41/ 41 41/ 41 41/ 43 48/ 54 68/ 77 88/100 108/123	185/185 185/185 185/185 185/185 185/185 185/185 185/185
								4.9	1.4	STD	— 17.3/ 20.0 26.0/ 30.0 34.7/ 40.0 52.0/ 60.0 69.3/ 80.0 86.7/100.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	41.4/ 41.4 41.4/ 41.4 41.4/ 45.4 51.3/ 57.9 72.9/ 82.9 94.5/107.9 116.3/132.9	45/ 45 45/ 45 45/ 50 60/ 60 80/ 90 100/110 125/150	40/ 40 40/ 40 40/ 42 47/ 53 67/ 76 87/ 99 107/122	162/162 162/162 162/162 162/162 162/162 162/162 162/162
								7.0	1.4	ALT	— 17.3/ 20.0 26.0/ 30.0 34.7/ 40.0 52.0/ 60.0 69.3/ 80.0 86.7/100.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	43.5/ 43.5 43.5/ 43.5 43.5/ 48.0 53.9/ 60.5 75.5/ 85.5 97.1/110.5 118.9/135.5	50/ 50 50/ 50 50/ 50 60/ 70 80/ 90 100/125 125/150	42/ 42 42/ 42 42/ 44 50/ 56 69/ 79 89/102 109/125	187/187 187/187 187/187 187/187 187/187 187/187 187/187
	208/230-3-60	187	253	17.6	123	1	1.5	5.2	—	STD	— 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6 40.0/46.2 50.0/57.7	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	28.7/28.7 28.7/28.7 28.7/28.7 31.5/35.4 44.0/49.8 56.5/64.3 69.0/78.6	30/30 30/30 30/30 35/40 45/50 60/70 70/80	28/28 28/28 28/28 29/33 40/46 52/59 63/72	156/156 156/156 156/156 156/156 156/156 156/156 156/156
										ALT	— 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6 40.0/46.2 50.0/57.7	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	28.7/28.7 28.7/28.7 28.7/28.7 31.5/35.4 44.0/49.8 56.5/64.3 69.0/78.6	30/30 30/30 30/30 35/40 45/50 60/70 70/80	28/28 28/28 28/28 29/33 40/46 52/59 63/72	156/156 156/156 156/156 156/156 156/156 156/156 156/156
									1.4	STD	— 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6 40.0/46.2 50.0/57.7	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	30.1/30.1 30.1/30.1 30.1/30.1 33.3/37.1 45.8/51.5 58.3/66.0 70.8/80.4	35/35 35/35 35/35 35/40 50/60 60/70 80/90	30/30 30/30 30/30 31/34 42/47 54/61 65/74	158/158 158/158 158/158 158/158 158/158 158/158 158/158
										ALT	— 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6 40.0/46.2 50.0/57.7	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	30.1/30.1 30.1/30.1 30.1/30.1 33.3/37.1 45.8/51.5 58.3/66.0 70.8/80.4	35/35 35/35 35/35 35/40 50/60 60/70 80/90	30/30 30/30 30/30 31/34 42/47 54/61 65/74	158/158 158/158 158/158 158/158 158/158 158/158 158/158
	460-3-60	414	506	7.7	50	1	0.8	2.6	—	STD	— 5.8 8.7 11.5 17.3 23.1 28.9	— 5.0 7.5 10.0 15.0 20.0 25.0	13.0 13.0 14.1 17.6 24.9 32.1 39.4	15 15 15 20 25 35 40	13 13 13 16 23 30 36	67 67 67 67 67 67 67
										ALT	— 5.8 8.7 11.5 17.3 23.1 28.9	— 5.0 7.5 10.0 15.0 20.0 25.0	13.0 13.0 14.1 17.6 24.9 32.1 39.4	15 15 15 20 25 35 40	13 13 13 16 23 30 36	67 67 67 67 67 67 67
									0.6	STD	— 5.8 8.7 11.5 17.3 23.1 28.9	— 5.0 7.5 10.0 15.0 20.0 25.0	13.6 13.6 14.9 18.4 25.6 32.9 40.1	15 15 15 20 30 35 45	13 13 14 17 24 30 37	68 68 68 68 68 68 68
										ALT	— 5.8 8.7 11.5 17.3 23.1 28.9	— 5.0 7.5 10.0 15.0 20.0 25.0	13.6 13.6 14.9 18.4 25.6 32.9 40.1	15 15 15 20 30 35 45	13 13 14 17 24 30 37	68 68 68 68 68 68 68

Table 2A — Electrical Data — Units Without Optional Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY Volts-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA		IFM FLA	POWER EXHAUST FLA (ea)	IFM TYPE	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				FLA	Nominal kW*	MCA	MOCP†	FLA	LRA
06 (cont)	575-3-60	518	633	6.1	40	1	0.8	2.0	—	STD	—	—	10.4	15	10	53
											9.2	10.0	14.0	15	13	53
											13.9	15.0	19.9	20	18	53
											18.5	20.0	25.6	30	24	53
											23.1	25.0	31.4	35	29	53
										ALT	—	—	10.4	15	10	53
											9.2	10.0	14.0	15	13	53
											13.9	15.0	19.9	20	18	53
											18.5	20.0	25.6	30	24	53
											23.1	25.0	31.4	35	29	53
									1.4	STD	—	—	11.8	15	12	55
											9.2	10.0	15.8	20	14	55
											13.9	15.0	21.6	25	20	55
											18.5	20.0	27.4	30	25	55
											23.1	25.0	33.1	35	30	55
										ALT	—	—	11.8	15	12	55
											9.2	10.0	15.8	20	14	55
											13.9	15.0	21.6	25	20	55
											18.5	20.0	27.4	30	25	55
											23.1	25.0	33.1	35	30	55
07	208/230-3-60	187	253	20.5	149	1	1.5	5.2	—	STD	—	—	32.3/32.3	35/35	31/31	182/182
											10.0/11.5	3.8/ 5.0	32.3/32.3	35/35	31/31	182/182
											15.0/17.3	5.6/ 7.5	32.3/32.3	35/35	31/31	182/182
											20.0/23.1	7.5/10.0	32.3/35.4	35/40	31/33	182/182
											30.0/34.6	11.3/15.0	44.0/49.8	45/50	40/46	182/182
											40.0/46.2	15.0/20.0	56.5/64.3	60/70	52/59	182/182
											50.0/57.7	18.8/25.0	69.0/78.6	70/80	63/72	182/182
								7.5	—	ALT	—	—	34.6/34.6	35/35	34/34	208/208
											10.0/11.5	3.8/ 5.0	34.6/34.6	35/35	34/34	208/208
											15.0/17.3	5.6/ 7.5	34.6/34.6	35/35	34/34	208/208
											20.0/23.1	7.5/10.0	34.6/38.3	35/40	34/35	208/208
											30.0/34.6	11.3/15.0	46.9/52.6	50/60	43/48	208/208
											40.0/46.2	15.0/20.0	59.4/67.1	60/70	55/62	208/208
											50.0/57.7	18.8/25.0	71.9/81.5	80/90	66/75	208/208
								5.2	1.4	STD	—	—	33.7/33.7	35/35	33/33	184/184
											10.0/11.5	3.8/ 5.0	33.7/33.7	35/35	33/33	184/184
											15.0/17.3	5.6/ 7.5	33.7/33.7	35/35	33/33	184/184
											20.0/23.1	7.5/10.0	33.7/37.1	35/40	33/34	184/184
											30.0/34.6	11.3/15.0	45.8/51.5	50/60	42/47	184/184
											40.0/46.2	15.0/20.0	58.3/66.0	60/70	54/61	184/184
											50.0/57.7	18.8/25.0	70.8/80.4	80/90	65/74	184/184
								7.5	1.4	ALT	—	—	36.0/36.0	40/40	36/36	210/210
											10.0/11.5	3.8/ 5.0	36.0/36.0	40/40	36/36	210/210
											15.0/17.3	5.6/ 7.5	36.0/36.0	40/40	36/36	210/210
											20.0/23.1	7.5/10.0	36.1/40.0	40/45	36/37	210/210
											30.0/34.6	11.3/15.0	48.6/54.4	50/60	45/50	210/210
											40.0/46.2	15.0/20.0	61.1/68.9	70/70	56/63	210/210
											50.0/57.7	18.8/25.0	73.6/83.3	80/90	68/77	210/210

LEGEND

FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
OFM — Outdoor (Condenser) Fan Motor
RLA — Rated Load Amps

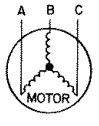
*Heater capacity (kW) is based on heater voltage of 208 v, 240 v, 480 v or 600 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

   $$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 230-3-60.



AB = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{224 + 231 + 226}{3}$$

$$= \frac{681}{3}$$

$$= 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{4}{227}$$

$$= 1.76\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact the local electric utility company immediately.

Table 2A — Electrical Data — Units Without Optional Convenience Outlet

UNIT 50PG	NOMINAL POWER SUPPLY Volts-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA		IFM FLA	POWER EXHAUST FLA (ea)	IFM TYPE	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				FLA	Nominal kW*	MCA	MOCP†	FLA	LRA
07 (cont)	460-3-60	414	506	9.6	75	1	0.8	2.6	—	STD	—	—	15.4	20	15	92
											5.8	5.0	15.4	20	15	92
											8.7	7.5	15.4	20	15	92
											11.5	10.0	17.6	20	16	92
											17.3	15.0	24.9	25	23	92
											23.1	20.0	32.1	35	30	92
											28.9	25.0	39.4	40	36	92
								3.4	—	ALT	—	—	16.2	20	16	105
											5.8	5.0	16.2	20	16	105
											8.7	7.5	16.2	20	16	105
											11.5	10.0	18.6	20	17	105
											17.3	15.0	25.9	30	24	105
											23.1	20.0	33.1	35	30	105
											28.9	25.0	40.4	45	37	105
								2.6	0.6	STD	—	—	16.0	20	16	93
											5.8	5.0	16.0	20	16	93
											8.7	7.5	16.0	20	16	93
											11.5	10.0	18.4	20	17	93
											17.3	15.0	25.6	30	24	93
											23.1	20.0	32.9	35	30	93
											28.9	25.0	40.1	45	37	93
								3.4	0.6	ALT	—	—	16.8	20	17	106
											5.8	5.0	16.8	20	17	106
											8.7	7.5	16.8	20	17	106
											11.5	10.0	19.4	20	18	106
											17.3	15.0	26.6	30	24	106
											23.1	20.0	33.9	35	31	106
											28.9	25.0	41.1	45	38	106
	575-3-60	518	633	7.6	54	1	0.8	2.0	—	STD	—	—	12.3	15	12	67
											9.2	10.0	14.0	15	13	67
											13.9	15.0	19.9	20	18	67
											18.5	20.0	25.6	30	24	67
											23.1	25.0	31.4	35	29	67
											27.7	30.0	37.1	40	34	67
								2.8	—	ALT	—	—	13.1	15	13	78
											9.2	10.0	15.0	15	14	78
											13.9	15.0	20.9	25	19	78
											18.5	20.0	26.6	30	24	78
											23.1	25.0	32.4	35	30	78
											27.7	30.0	38.1	40	35	78
								2.0	1.4	STD	—	—	13.7	15	14	69
											9.2	10.0	15.8	20	14	69
											13.9	15.0	21.6	25	20	69
											18.5	20.0	27.4	30	25	69
											23.1	25.0	33.1	35	30	69
											27.7	30.0	38.9	40	36	69
								2.8	1.4	ALT	—	—	14.5	15	14	80
											9.2	10.0	16.8	20	15	80
											13.9	15.0	22.6	25	21	80
											18.5	20.0	28.4	30	26	80
											23.1	25.0	34.1	35	31	80
											27.7	30.0	39.9	40	37	80

Table 2B — Electrical Data — Units With Optional Convenience Outlet

UNIT 50PG	NOMINAL POWER SUPPLY Volts-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA		IFM FLA	POWER EXHAUST FLA (ea)	IFM TYPE	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				FLA	Nominal kW*	MCA	MOCP†	FLA	LRA
03	208/230-1-60	187	253	12.8	60	1	1.0	4.9	—	STD	—	—	26.7/26.7	30/30	27/27	79/79
											10.8/12.5	2.3/ 3.0	26.7/27.8	30/30	27/27	79/79
											17.3/20.0	3.8/ 5.0	33.8/37.1	35/40	31/34	79/79
											26.0/30.0	5.6/ 7.5	44.6/49.6	45/50	41/46	79/79
											34.7/40.0	7.5/10.0	55.5/62.1	60/70	51/57	79/79
										ALT	—	—	26.7/26.7	30/30	27/27	79/79
											10.8/12.5	2.3/ 3.0	26.7/27.8	30/30	27/27	79/79
											17.3/20.0	3.8/ 5.0	33.8/37.1	35/40	31/34	79/79
											26.0/30.0	5.6/ 7.5	44.6/49.6	45/50	41/46	79/79
											34.7/40.0	7.5/10.0	55.5/62.1	60/70	51/57	79/79
									1.4	STD	—	—	28.1/28.1	30/30	29/29	81/81
											10.8/12.5	2.3/ 3.0	28.1/29.5	30/30	29/29	81/81
											17.3/20.0	3.8/ 5.0	35.5/38.9	40/40	33/36	81/81
											26.0/30.0	5.6/ 7.5	46.4/51.4	50/60	43/47	81/81
											34.7/40.0	7.5/10.0	57.3/63.9	60/70	53/59	81/81
										ALT	—	—	28.1/28.1	30/30	29/29	81/81
											10.8/12.5	2.3/ 3.0	28.1/29.5	30/30	29/29	81/81
											17.3/20.0	3.8/ 5.0	35.5/38.9	40/40	33/36	81/81
											26.0/30.0	5.6/ 7.5	46.4/51.4	50/60	43/47	81/81
											34.7/40.0	7.5/10.0	57.3/63.9	60/70	53/59	81/81
04	208/230-1-60	187	253	15.4	83	1	1.0	4.9	—	STD	—	—	30.0/30.0	30/30	30/30	102/102
											10.8/12.5	2.3/ 3.0	30.0/30.0	30/30	30/30	102/102
											17.3/20.0	3.8/ 5.0	33.8/37.1	35/40	31/34	102/102
											26.0/30.0	5.6/ 7.5	44.6/49.6	45/50	41/46	102/102
											34.7/40.0	7.5/10.0	55.5/62.1	60/70	51/57	102/102
											52.0/60.0	11.3/15.0	77.1/87.1	80/90	71/80	102/102
										ALT	—	—	30.0/30.0	30/30	30/30	102/102
											10.8/12.5	2.3/ 3.0	30.0/30.0	30/30	30/30	102/102
											17.3/20.0	3.8/ 5.0	33.8/37.1	35/40	31/34	102/102
											26.0/30.0	5.6/ 7.5	44.6/49.6	45/50	41/46	102/102
											34.7/40.0	7.5/10.0	55.5/62.1	60/70	51/57	102/102
											52.0/60.0	11.3/15.0	77.1/87.1	80/90	71/80	102/102
									1.4	STD	—	—	31.4/31.4	35/35	32/32	104/104
											10.8/12.5	2.3/ 3.0	31.4/31.4	35/35	32/32	104/104
											17.3/20.0	3.8/ 5.0	35.5/38.9	40/40	33/36	104/104
											26.0/30.0	5.6/ 7.5	46.4/51.4	50/60	43/47	104/104
											34.7/40.0	7.5/10.0	57.3/63.9	60/70	53/59	104/104
											52.0/60.0	11.3/15.0	78.9/88.9	80/90	73/82	104/104
										ALT	—	—	31.4/31.4	35/35	32/32	104/104
											10.8/12.5	2.3/ 3.0	31.4/31.4	35/35	32/32	104/104
											17.3/20.0	3.8/ 5.0	35.5/38.9	40/40	33/36	104/104
											26.0/30.0	5.6/ 7.5	46.4/51.4	50/60	43/47	104/104
											34.7/40.0	7.5/10.0	57.3/63.9	60/70	53/59	104/104
											52.0/60.0	11.3/15.0	78.9/88.9	80/90	73/82	104/104

LEGEND

FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
OFM — Outdoor (Condenser) Fan Motor
RLA — Rated Load Amps

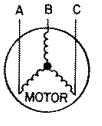
*Heater capacity (kW) is based on heater voltage of 208 v, 240 v, 480 v or 600 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

   $$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 230-3-60.



AB = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{224 + 231 + 226}{3}$$

$$= \frac{681}{3}$$

$$= 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{227}$$

$$= 1.76\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact the local electric utility company immediately.

Table 2B — Electrical Data — Units With Optional Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY Volts-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA		IFM FLA	POWER EXHAUST FLA (ea)	IFM TYPE	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				FLA	Nominal kW*	MCA	MOCP†	FLA	LRA
04 (cont)	208/230-3-60	187	253	11.5	77	1	1.0	4.9	—	STD	— 6.3/ 7.2 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6	— 2.3/ 3.0 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0	25.1/25.1 25.1/25.1 25.1/26.5 30.9/33.8 37.1/41.0 49.6/55.4	30/30 30/30 30/30 35/35 40/45 50/60	26/26 26/26 26/26 28/31 34/38 46/51	96/96 96/96 96/96 96/96 96/96 96/96
										ALT	— 6.3/ 7.2 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6	— 2.3/ 3.0 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0	25.1/25.1 25.1/25.1 25.1/26.5 30.9/33.8 37.1/41.0 49.6/55.4	30/30 30/30 30/30 35/35 40/45 50/60	26/26 26/26 26/26 28/31 34/38 46/51	96/96 96/96 96/96 96/96 96/96 96/96
									1.4	STD	— 6.3/ 7.2 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6	— 2.3/ 3.0 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0	26.5/26.5 26.5/26.5 26.5/28.3 32.6/35.5 38.9/42.8 51.4/57.1	30/30 30/30 30/30 35/40 40/45 60/60	27/27 27/27 27/27 30/33 36/39 47/53	98/98 98/98 98/98 98/98 98/98 98/98
										ALT	— 6.3/ 7.2 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6	— 2.3/ 3.0 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0	26.5/26.5 26.5/26.5 26.5/28.3 32.6/35.5 38.9/42.8 51.4/57.1	30/30 30/30 30/30 35/40 40/45 60/60	27/27 27/27 27/27 30/33 36/39 47/53	98/98 98/98 98/98 98/98 98/98 98/98
	460-3-60	414	506	5.1	35	1	0.5	2.1	—	STD	— 3.5 5.8 8.7 11.5 17.3	— 3.0 5.0 7.5 10.0 15.0	11.2 11.2 12.6 16.3 19.8 27.0	15 15 15 20 20 30	11 11 12 15 18 25	44 44 44 44 44 44
										ALT	— 3.5 5.8 8.7 11.5 17.3	— 3.0 5.0 7.5 10.0 15.0	11.2 11.2 12.6 16.3 19.8 27.0	15 15 15 20 20 30	11 11 12 15 18 25	44 44 44 44 44 44
									0.6	STD	— 3.5 5.8 8.7 11.5 17.3	— 3.0 5.0 7.5 10.0 15.0	11.8 11.8 13.4 17.0 20.5 27.8	15 15 15 20 25 30	12 12 12 16 19 26	45 45 45 45 45 45
										ALT	— 3.5 5.8 8.7 11.5 17.3	— 3.0 5.0 7.5 10.0 15.0	11.8 11.8 13.4 17.0 20.5 27.8	15 15 15 20 25 30	12 12 12 16 19 26	45 45 45 45 45 45
	575-3-60	518	633	4.3	31	1	0.5	2.1	—	STD	— 9.2 13.9	— 10.0 15.0	9.7 16.3 22.1	15 20 25	10 15 20	39 39 39
										ALT	— 9.2 13.9	— 10.0 15.0	9.7 16.3 22.1	15 20 25	10 15 20	39 39 39
									1.4	STD	— 9.2 13.9	— 10.0 15.0	11.1 18.0 23.9	15 20 25	12 17 22	41 41 41
										ALT	— 9.2 13.9	— 10.0 15.0	11.1 18.0 23.9	15 20 25	12 17 22	41 41 41
05	208/230-1-60	187	253	20.5	109	1	1.0	4.9	—	STD	— 17.3/20.0 26.0/30.0 34.7/40.0 52.0/60.0 69.3/80.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0	36.3/ 36.3 36.3/ 37.1 44.6/ 49.6 55.5/ 62.1 77.1/ 87.1 98.8/112.1	40/ 40 40/ 40 45/ 50 60/ 70 80/ 90 100/125	36/ 36 36/ 36 41/ 46 51/ 57 71/ 80 91/103	128/128 128/128 128/128 128/128 128/128 128/128
								7.0	—	ALT	— 17.3/20.0 26.0/30.0 34.7/40.0 52.0/60.0 69.3/80.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0	38.4/ 38.4 38.4/ 39.8 47.3/ 52.3 58.1/ 64.8 79.8/ 89.8 101.4/114.8	40/ 40 40/ 40 50/ 60 60/ 70 80/ 90 110/125	38/ 38 38/ 38 43/ 48 53/ 60 73/ 83 93/106	153/153 153/153 153/153 153/153 153/153 153/153
								4.9	1.4	STD	— 17.3/20.0 26.0/30.0 34.7/40.0 52.0/60.0 69.3/80.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0	37.7/ 37.7 37.7/ 38.9 46.4/ 51.4 57.3/ 63.9 78.9/ 88.9 100.5/113.9	40/ 40 40/ 40 50/ 60 60/ 70 80/ 90 110/125	37/ 37 37/ 37 43/ 47 53/ 59 73/ 82 92/105	130/130 130/130 130/130 130/130 130/130 130/130
								7.0	1.4	ALT	— 17.3/20.0 26.0/30.0 34.7/40.0 52.0/60.0 69.3/80.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0	39.8/ 39.8 39.8/ 41.5 49.0/ 54.0 59.9/ 66.5 81.5/ 91.5 103.1/116.5	40/ 40 40/ 45 50/ 60 60/ 70 90/100 110/125	40/ 40 40/ 40 45/ 50 55/ 61 75/ 84 95/107	155/155 155/155 155/155 155/155 155/155 155/155

Table 2B — Electrical Data — Units With Optional Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY Volts-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA		IFM FLA	POWER EXHAUST FLA (ea)	IFM TYPE	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				FLA	Nominal kW*	MCA	MOCP†	FLA	LRA
05 (cont)	208/230-3-60	187	253	14.6	91	1	1.0	4.9	—	STD	—	—	29.0/29.0	30/30	29/29	110/110
											10.0/11.5	3.8/ 5.0	29.0/29.0	30/30	29/29	110/110
											15.0/17.3	5.6/ 7.5	30.9/33.8	35/35	29/31	110/110
											20.0/23.1	7.5/10.0	37.1/41.0	40/45	34/38	110/110
											30.0/34.6	11.3/15.0	49.6/55.4	50/60	46/51	110/110
											40.0/46.2	15.0/20.0	62.1/69.9	70/70	57/64	110/110
								5.2	—	ALT	—	—	29.3/29.3	30/30	29/29	128/128
											10.0/11.5	3.8/ 5.0	29.3/29.3	30/30	29/29	128/128
											15.0/17.3	5.6/ 7.5	31.3/34.1	35/35	29/31	128/128
											20.0/23.1	7.5/10.0	37.5/41.4	40/45	35/38	128/128
											30.0/34.6	11.3/15.0	50.0/55.8	60/60	46/51	128/128
											40.0/46.2	15.0/20.0	62.5/70.3	70/80	58/65	128/128
								4.9	1.4	STD	—	—	30.4/30.4	35/35	31/31	112/112
											10.0/11.5	3.8/ 5.0	30.4/30.4	35/35	31/31	112/112
											15.0/17.3	5.6/ 7.5	32.6/35.5	35/40	31/33	112/112
											20.0/23.1	7.5/10.0	38.9/42.8	40/45	36/39	112/112
											30.0/34.6	11.3/15.0	51.4/57.1	60/60	47/53	112/112
											40.0/46.2	15.0/20.0	63.9/71.6	70/80	59/66	112/112
								5.2	1.4	ALT	—	—	30.7/30.7	35/35	31/31	130/130
											10.0/11.5	3.8/ 5.0	30.7/30.7	35/35	31/31	130/130
											15.0/17.3	5.6/ 7.5	33.0/35.9	35/40	31/33	130/130
											20.0/23.1	7.5/10.0	39.3/43.1	40/45	36/40	130/130
											30.0/34.6	11.3/15.0	51.8/57.5	60/60	48/53	130/130
											40.0/46.2	15.0/20.0	64.3/72.0	70/80	59/66	130/130
	460-3-60	414	506	7.1	46	1	0.5	2.1	—	STD	—	—	13.7	15	14	55
											5.8	5.0	13.7	15	14	55
											8.7	7.5	16.3	20	15	55
											11.5	10.0	19.8	20	18	55
											17.3	15.0	27.0	30	25	55
											23.1	20.0	34.3	35	32	55
								2.6	—	ALT	—	—	14.2	15	14	64
											5.8	5.0	14.2	15	14	64
											8.7	7.5	16.9	20	16	64
											11.5	10.0	20.4	25	19	64
											17.3	15.0	27.6	30	25	64
											23.1	20.0	34.9	35	32	64
								2.1	0.6	STD	—	—	14.3	15	14	56
											5.8	5.0	14.3	15	14	56
											8.7	7.5	17.0	20	16	56
											11.5	10.0	20.5	25	19	56
											17.3	15.0	27.8	30	26	56
											23.1	20.0	35.0	40	32	56
								2.6	0.6	ALT	—	—	14.8	15	15	65
											5.8	5.0	14.8	15	15	65
											8.7	7.5	17.6	20	16	65
											11.5	10.0	21.1	25	19	65
											17.3	15.0	28.4	30	26	65
											23.1	20.0	35.6	40	33	65

LEGEND

FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
OFM — Outdoor (Condenser) Fan Motor
RLA — Rated Load Amps

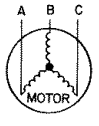
*Heater capacity (kW) is based on heater voltage of 208 v, 240 v, 480 v or 600 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

   $$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 230-3-60.



AB = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{224 + 231 + 226}{3}$$

$$= \frac{681}{3}$$

$$= 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{4}{227}$$

$$= 1.76\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact the local electric utility company immediately.

Table 2B — Electrical Data — Units With Optional Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY Volts-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA		IFM FLA	POWER EXHAUST FLA (ea)	IFM TYPE	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				FLA	Nominal kW*	MCA	MOCP†	FLA	LRA
05 (cont)	575-3-60	518	633	5.1	34	1	0.5	2.1	—	STD	— 9.2 13.9 18.5	— 10.0 15.0 20.0	10.7 16.3 22.1 27.9	15 20 25 30	11 15 20 26	42 42 42 42
								2.0	—	ALT	— 9.2 13.9 18.5	— 10.0 15.0 20.0	10.6 16.1 22.0 27.8	15 20 25 30	11 15 20 26	48 48 48 48
								2.1	1.4	STD	— 9.2 13.9 18.5	— 10.0 15.0 20.0	12.1 18.0 23.9 29.6	15 20 25 30	12 17 22 27	44 44 44 44
								2.0	1.4	ALT	— 9.2 13.9 18.5	— 10.0 15.0 20.0	12.0 17.9 23.8 29.5	15 20 25 30	12 16 22 27	50 50 50 50
06	208/230-1-60	187	253	26.9	145	1	1.5	4.9	—	STD	— 17.3/ 20.0 26.0/ 30.0 34.7/ 40.0 52.0/ 60.0 69.3/ 80.0 86.7/100.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	44.8/ 44.8 44.8/ 44.8 44.8/ 49.6 55.5/ 62.1 77.1/ 87.1 98.8/112.1 120.5/137.1	50/ 50 50/ 50 50/ 50 60/ 70 80/ 90 100/125 125/150	44/ 44 44/ 44 44/ 46 51/ 57 71/ 80 91/103 111/126	165/165 165/165 165/165 165/165 165/165 165/165 165/165
								7.0	—	ALT	— 17.3/ 20.0 26.0/ 30.0 34.7/ 40.0 52.0/ 60.0 69.3/ 80.0 86.7/100.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	46.9/ 46.9 46.9/ 46.9 47.3/ 52.3 58.1/ 64.8 79.8/ 89.8 101.4/114.8 123.1/139.8	50/ 50 50/ 50 50/ 60 60/ 70 80/ 90 110/125 125/150	46/ 46 46/ 46 46/ 48 53/ 60 73/ 83 93/106 113/129	190/190 190/190 190/190 190/190 190/190 190/190 190/190
								4.9	1.4	STD	— 17.3/ 20.0 26.0/ 30.0 34.7/ 40.0 52.0/ 60.0 69.3/ 80.0 86.7/100.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	46.2/ 46.2 46.2/ 46.2 46.4/ 51.4 57.3/ 63.9 78.9/ 88.9 100.5/113.9 122.3/138.9	50/ 50 50/ 50 50/ 60 60/ 70 80/ 90 110/125 125/150	45/ 45 45/ 45 45/ 47 53/ 59 73/ 82 92/105 112/128	167/167 167/167 167/167 167/167 167/167 167/167 167/167
								7.0	1.4	ALT	— 17.3/ 20.0 26.0/ 30.0 34.7/ 40.0 52.0/ 60.0 69.3/ 80.0 86.7/100.0	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	48.3/ 48.3 48.3/ 48.3 49.0/ 54.0 59.9/ 66.5 81.5/ 91.5 103.1/116.5 124.9/141.5	50/ 50 50/ 50 50/ 60 60/ 70 90/100 110/125 125/150	48/ 48 48/ 48 48/ 50 55/ 61 75/ 84 95/107 115/130	192/192 192/192 192/192 192/192 192/192 192/192 192/192
	208/230-3-60	187	253	17.6	123	1	1.5	5.2	—	STD	— 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6 40.0/46.2 50.0/57.7	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	33.5/33.5 33.5/33.5 33.5/34.1 37.5/41.4 50.0/55.8 62.5/70.3 75.0/84.6	35/35 35/35 35/35 40/45 60/60 70/80 80/90	33/33 33/33 33/33 35/38 46/51 58/65 69/78	161/161 161/161 161/161 161/161 161/161 161/161 161/161
										ALT	— 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6 40.0/46.2 50.0/57.7	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	33.5/33.5 33.5/33.5 33.5/34.1 37.5/41.4 50.0/55.8 62.5/70.3 75.0/84.6	35/35 35/35 35/35 40/45 60/60 70/80 80/90	33/33 33/33 33/33 35/38 46/51 58/65 69/78	161/161 161/161 161/161 161/161 161/161 161/161 161/161
									1.4	STD	— 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6 40.0/46.2 50.0/57.7	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	34.9/34.9 34.9/34.9 34.9/35.9 39.3/43.1 51.8/57.5 64.3/72.0 76.8/86.4	35/35 35/35 35/40 40/45 60/60 70/80 80/90	35/35 35/35 35/35 36/40 48/53 59/66 71/79	163/163 163/163 163/163 163/163 163/163 163/163 163/163
										ALT	— 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6 40.0/46.2 50.0/57.7	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	34.9/34.9 34.9/34.9 34.9/35.9 39.3/43.1 51.8/57.5 64.3/72.0 76.8/86.4	35/35 35/35 35/40 40/45 60/60 70/80 80/90	35/35 35/35 35/35 36/40 48/53 59/66 71/79	163/163 163/163 163/163 163/163 163/163 163/163 163/163

Table 2B — Electrical Data — Units With Optional Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY Volts-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA		IFM FLA	POWER EXHAUST FLA (ea)	IFM TYPE	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				FLA	Nominal kW*	MCA	MOCP†	FLA	LRA
06 (cont)	460-3-60	414	506	7.7	50	1	0.8	2.6	—	STD	—	—	15.2	20	15	69
											5.8	5.0	15.2	20	15	69
											8.7	7.5	16.9	20	16	69
											11.5	10.0	20.4	25	19	69
											17.3	15.0	27.6	30	25	69
											23.1	20.0	34.9	35	32	69
											28.9	25.0	42.1	45	39	69
										ALT	—	—	15.2	20	15	69
											5.8	5.0	15.2	20	15	69
											8.7	7.5	16.9	20	16	69
											11.5	10.0	20.4	25	19	69
											17.3	15.0	27.6	30	25	69
											23.1	20.0	34.9	35	32	69
											28.9	25.0	42.1	45	39	69
									0.6	STD	—	—	15.8	20	16	70
											5.8	5.0	15.8	20	16	70
											8.7	7.5	17.6	20	16	70
											11.5	10.0	21.1	25	19	70
											17.3	15.0	28.4	30	26	70
											23.1	20.0	35.6	40	33	70
											28.9	25.0	42.9	45	39	70
										ALT	—	—	15.8	20	16	70
											5.8	5.0	15.8	20	16	70
											8.7	7.5	17.6	20	16	70
											11.5	10.0	21.1	25	19	70
											17.3	15.0	28.4	30	26	70
											23.1	20.0	35.6	40	33	70
											28.9	25.0	42.9	45	39	70
	575-3-60	518	633	6.1	40	1	0.8	2.0	—	STD	—	—	12.1	15	12	55
											9.2	10.0	16.1	20	15	55
											13.9	15.0	22.0	25	20	55
											18.5	20.0	27.8	30	26	55
											23.1	25.0	33.5	35	31	55
										ALT	—	—	12.1	15	12	55
											9.2	10.0	16.1	20	15	55
											13.9	15.0	22.0	25	20	55
											18.5	20.0	27.8	30	26	55
											23.1	25.0	33.5	35	31	55
									1.4	STD	—	—	13.5	15	14	57
											9.2	10.0	17.9	20	16	57
											13.9	15.0	23.8	25	22	57
											18.5	20.0	29.5	30	27	57
											23.1	25.0	35.3	40	32	57
										ALT	—	—	13.5	15	14	57
											9.2	10.0	17.9	20	16	57
											13.9	15.0	23.8	25	22	57
											18.5	20.0	29.5	30	27	57
											23.1	25.0	35.3	40	32	57

LEGEND

FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
OFM — Outdoor (Condenser) Fan Motor
RLA — Rated Load Amps

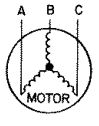
*Heater capacity (kW) is based on heater voltage of 208 v, 240 v, 480 v or 600 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

   $$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 230-3-60.



AB = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{224 + 231 + 226}{3}$$

$$= \frac{681}{3}$$

$$= 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{4}{227}$$

$$= 1.76\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact the local electric utility company immediately.

Table 2B — Electrical Data — Units With Optional Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY Volts-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA		IFM FLA	POWER EXHAUST FLA (ea)	IFM TYPE	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				FLA	Nominal kW*	MCA	MOCP†	FLA	LRA
07	208/230-1-60	187	253	20.5	149	1	1.5	5.2	—	STD	— 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6 40.0/46.2 50.0/57.7	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	37.1/37.1 37.1/37.1 37.1/37.1 37.5/41.4 50.0/55.8 62.5/70.3 75.0/84.6	40/40 40/40 40/40 40/45 60/60 70/80 80/90	37/37 37/37 37/37 37/38 46/51 58/65 69/78	187/187 187/187 187/187 187/187 187/187 187/187 187/187
								7.5	—	ALT	— 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6 40.0/46.2 50.0/57.7	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	39.4/39.4 39.4/39.4 39.4/39.4 40.4/44.3 52.9/58.6 65.4/73.1 77.9/87.5	40/40 40/40 40/40 45/45 60/60 70/80 80/90	39/39 39/39 39/39 39/41 49/54 60/67 72/81	213/213 213/213 213/213 213/213 213/213 213/213 213/213
								5.2	1.4	STD	— 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6 40.0/46.2 50.0/57.7	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	38.5/38.5 38.5/38.5 38.5/38.5 39.3/43.1 51.8/57.5 64.3/72.0 76.8/86.4	40/40 40/40 40/40 40/45 60/60 70/80 80/90	38/38 38/38 38/38 38/40 48/53 59/66 71/79	189/189 189/189 189/189 189/189 189/189 189/189 189/189
								7.5	1.4	ALT	— 10.0/11.5 15.0/17.3 20.0/23.1 30.0/34.6 40.0/46.2 50.0/57.7	— 3.8/ 5.0 5.6/ 7.5 7.5/10.0 11.3/15.0 15.0/20.0 18.8/25.0	40.8/40.8 40.8/40.8 40.8/40.8 42.1/46.0 54.6/60.4 67.1/74.9 79.6/89.3	45/45 45/45 45/45 45/50 60/70 70/80 80/90	41/41 41/41 41/41 41/42 50/56 62/69 73/82	215/215 215/215 215/215 215/215 215/215 215/215 215/215
	460-3-60	414	506	9.6	75	1	0.8	2.6	—	STD	— 5.8 8.7 11.5 17.3 23.1 28.9	— 5.0 7.5 10.0 15.0 20.0 25.0	17.6 17.6 17.6 20.4 27.6 34.9 42.1	20 20 20 25 30 35 45	17 17 17 19 25 32 39	94 94 94 94 94 94 94
								3.4	—	ALT	— 5.8 8.7 11.5 17.3 23.1 28.9	— 5.0 7.5 10.0 15.0 20.0 25.0	18.4 18.4 18.4 21.4 28.6 35.9 43.1	20 20 20 25 30 40 45	18 18 18 20 26 33 40	107 107 107 107 107 107 107
								2.6	0.6	STD	— 5.8 8.7 11.5 17.3 23.1 28.9	— 5.0 7.5 10.0 15.0 20.0 25.0	18.2 18.2 18.2 21.1 28.4 35.6 42.9	20 20 20 25 30 40 45	18 18 18 19 26 33 39	95 95 95 95 95 95 95
								3.4	0.6	ALT	— 5.8 8.7 11.5 17.3 23.1 28.9	— 5.0 7.5 10.0 15.0 20.0 25.0	19.0 19.0 19.0 22.1 29.4 36.6 43.9	20 20 20 25 30 40 45	19 19 19 20 27 34 40	108 108 108 108 108 108 108
	575-3-60	518	633	7.6	54	1	0.8	2.0	—	STD	— 9.2 13.9 18.5 23.1 27.7	— 10.0 15.0 20.0 25.0 30.0	14.0 16.1 22.0 27.8 33.5 39.3	15 20 25 30 35 40	14 15 20 26 31 36	69 69 69 69 69 69
								2.8	—	ALT	— 9.2 13.9 18.5 23.1 27.7	— 10.0 15.0 20.0 25.0 30.0	14.8 17.1 23.0 28.8 34.5 40.3	15 20 25 30 35 45	15 16 21 26 32 37	80 80 80 80 80 80
								2.0	1.4	STD	— 9.2 13.9 18.5 23.1 27.7	— 10.0 15.0 20.0 25.0 30.0	15.4 17.9 23.8 29.5 35.3 41.0	20 20 25 30 40 45	16 16 22 27 32 38	71 71 71 71 71 71
								2.8	1.4	ALT	— 9.2 13.9 18.5 23.1 27.7	— 10.0 15.0 20.0 25.0 30.0	16.2 18.9 24.8 30.5 36.3 42.0	20 20 25 35 40 45	16 17 23 28 33 39	82 82 82 82 82 82

**Step 8 — Optional EconoMi$er IV —** The optional EconoMi$er IV comes from the factory fully wired. Outdoor air hoods must be installed. No field wiring is required for standard outdoor dry bulb changeover operation. Field wiring of accessory sensors is required for different operational modes.

INSTALL OUTDOOR AIR HOODS — Perform the following procedure to install the outdoor-air hoods:

1. Economizer and barometric relief hoods are located in the condenser section under the slanted coil for shipping. See Fig. 10. Barometric relief/power exhaust hood is shipped inside of economizer hood. Remove screws that secure the wooden rails of the hood assemblies to the unit. Save screws. Slide complete assembly from condenser section.
2. Remove the screws that secure the economizer and barometric relief/power exhaust hoods to the wooden railing. Discard or recycle wooden rails. Save screws.
3. The barometric relief damper is secured to the economizer panel for shipping. Remove the screw holding the barometric relief damper to the panel. Damper should be free to swing open during operation. See Fig. 11.
4. Hang the barometric relief/power exhaust hood on the mounting flange on the economizer panel. Secure hood to panel with screws saved from Step 2. See Fig. 11 and 12.
5. Align hole in flange of economizer panel with left edge of hood. Hang economizer hood on the top flange of the economizer panel by rotating hood until top flange of the economizer hood engages the bent flange on the economizer panel. Rotate hood until hood is flush with the economizer panel. Hood will support itself from flange. Align holes in hood with holes in panel and secure hood to panel with screws saved from Step 2. See Fig. 11 and 13.

ECONOMI$ER IV STANDARD SENSORS

Outdoor-Air Temperature (OAT) Sensor — The outdoor-air temperature sensor is a 10 to 20 mA device used to measure the outdoor-air temperature. The outdoor-air temperature is used to determine when the EconoMi$er IV can be used for free cooling. The sensor is factory-installed on the EconoMi$er IV in the outdoor airstream. The operating range of temperature measurement is 40 to 100 F.

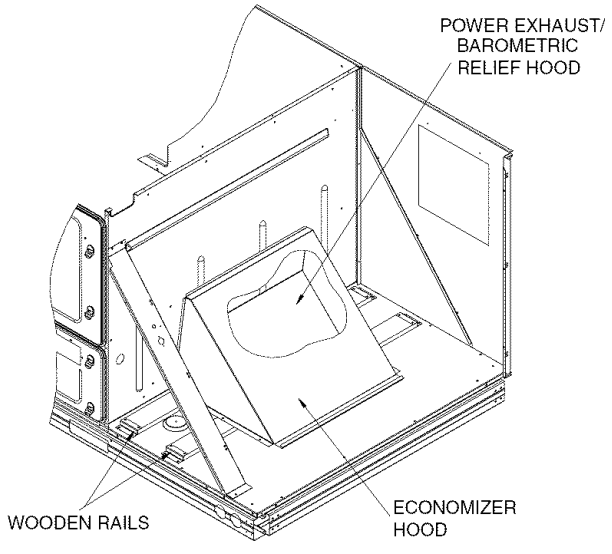


Fig. 10 — Economizer and Barometric Relief/Power Exhaust Hoods Shipping Positions

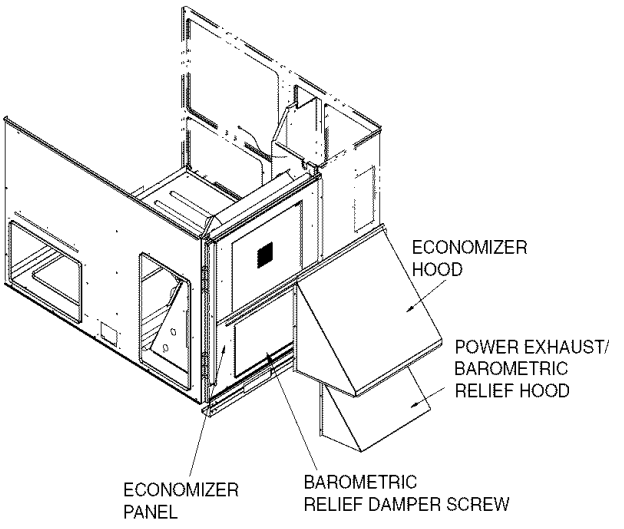


Fig. 11 — Hood Installation

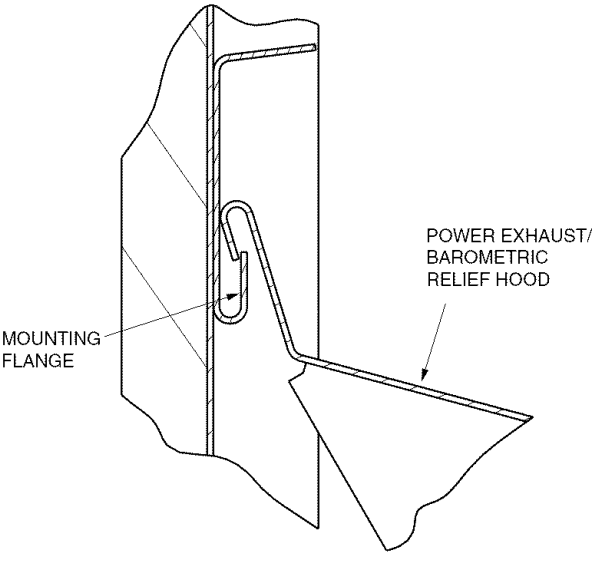


Fig. 12 — Barometric Relief/Power Exhaust Hood Flange

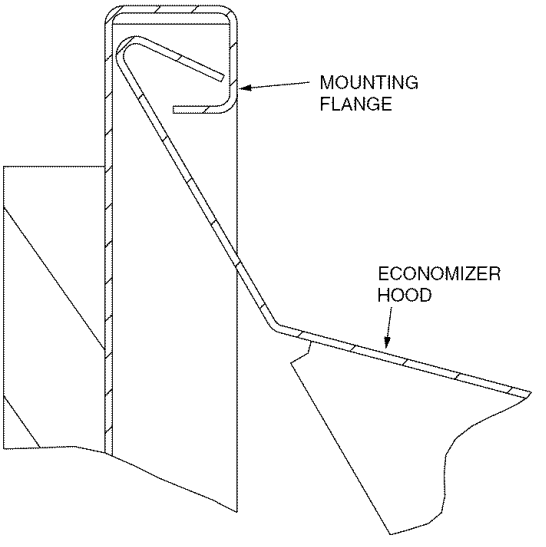


Fig. 13 — Economizer Flange

Mixed-Air Temperature (MAT) Sensor — The mixed-air temperature sensor is a 3 K thermistor located at the discharge of the indoor fan. The sensor is mounted through the side plate of the blower. The sensor is a probe and has blue leads. This sensor is factory installed. The operating range of temperature measurement is 0° to 158 F.

Outdoor Air Lockout Sensor — The EconoMi$er IV is equipped with a temperature limit switch located in the outdoor airstream which is used to lock out the compressors below a 50 F ambient temperature.

ECONOMI$ER IV CONTROLLER WIRING AND OPERATIONAL MODES — Determine the EconoMi$er IV control mode before installing sensors and accessories. Different sensors are required for different control modes, and a number of accessories are available. Refer to Table 3. The EconoMi$er IV is supplied from the factory with a mixed air temperature sensor and an outdoor air temperature sensor. This allows for operation of the EconoMi$er IV with outdoor air dry bulb changeover control. Additional accessories can be added to allow for different types of changeover control and operation of the EconoMi$er IV and unit. See Fig. 14 for wiring.

Outdoor Dry Bulb Changeover — The standard controller is shipped from the factory configured for outdoor dry bulb changeover control. The outdoor-air and mixed-air temperature sensors are included as standard. For this control mode, the outdoor temperature is compared to an adjustable set point selected on the control. If the outdoor-air temperature is above the set point, the EconoMi$er IV will adjust the outside air dampers to minimum position. If the outdoor-air temperature is below the set point, the position of the outside air dampers will be controlled to provided free cooling using outdoor air. When in this mode, the LED next to the free cooling set point potentiometer will be on. The changeover temperature set point is controlled by the free cooling set point potentiometer located on the control. The scale on the potentiometer is A, B, C, and D. See Fig. 15 for the corresponding temperature changeover values.

Differential Dry Bulb Control — For differential dry bulb control the standard outdoor dry bulb sensor is used in conjunction with an additional accessory dry bulb sensor (part number CRTEMPSN002A00). The accessory sensor must be mounted in the return airstream. Connect the return air temperature sensor to the S_R terminal (after removing the 620-ohm resistor) and to the + terminal on the controller. See Fig. 16.

In this mode of operation, the outdoor-air temperature is compared to the return-air temperature and the lower temperature air stream is used for cooling. When using this mode of changeover control, turn the enthalpy set point potentiometer fully clockwise to the D setting. See Fig. 17.

Outdoor Enthalpy Changeover — For enthalpy control, accessory enthalpy sensor (part number HH57AC078) is required. Replace the standard outdoor dry bulb temperature sensor with the accessory enthalpy sensor in the same mounting location. When the outdoor air enthalpy rises above the outdoor enthalpy changeover set point, the outdoor-air damper moves to its minimum position. The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$er IV controller. The set points are A, B, C, and D. See Fig. 18. The factory-installed 620-ohm jumper must be in place across terminals S_R and + on the EconoMi$er IV controller. See Fig. 16.

Differential Enthalpy Control — For differential enthalpy control, the EconoMi$er IV controller uses two enthalpy sensors (CRENTDIF004A00), one in the outside air and one in the return air duct. The EconoMi$er IV controller compares the outdoor air enthalpy to the return air enthalpy to determine EconoMi$er IV use. The controller selects the lower enthalpy air (return or outdoor) for cooling. For example, when the outdoor air has a lower enthalpy than the return air, the EconoMi$er IV opens to bring in outdoor air for free cooling.

Replace the standard outside air dry bulb temperature sensor with the accessory enthalpy sensor in the same mounting location. Mount the return air enthalpy sensor in the return air duct. The return air enthalpy sensor is wired to terminals S_R and + on the EconoMi$er IV controller. See Fig. 16. The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$er IV controller. When using this mode of changeover control, turn the enthalpy set point potentiometer fully clockwise to the D setting.

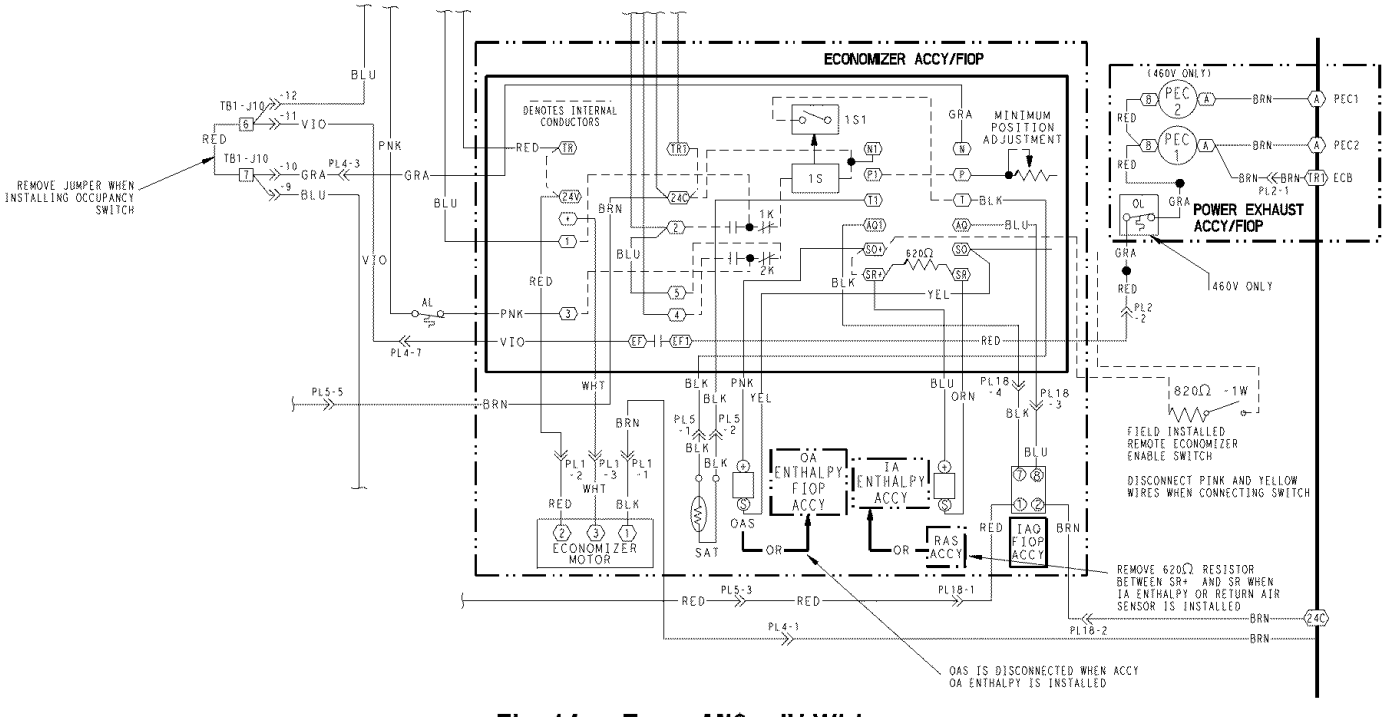

ECONOMIZER ACCY/FIOP
DENOTES INTERNAL CONDUCTORS
MINIMUM POSITION ADJUSTMENT
(460V ONLY)
POWER EXHAUST ACCY/FIOP
460V ONLY
REMOVE JUMPER WHEN INSTALLING OCCUPANCY SWITCH
820Ω -1W
FIELD INSTALLED REMOTE ECONOMIZER ENABLE SWITCH
DISCONNECT PINK AND YELLOW WIRES WHEN CONNECTING SWITCH
ECONOMIZER MOTOR
OA ENTHALPY FIOP ACCY
IA ENTHALPY ACCY
RAS ACCY
IAQ FIOP ACCY
SAT
OAS
REMOVE 620Ω RESISTOR BETWEEN SR+ AND SR- WHEN IA ENTHALPY OR RETURN AIR SENSOR IS INSTALLED
OAS IS DISCONNECTED WHEN ACCY OA ENTHALPY IS INSTALLED

Fig. 14 — EconoMi$er IV Wiring

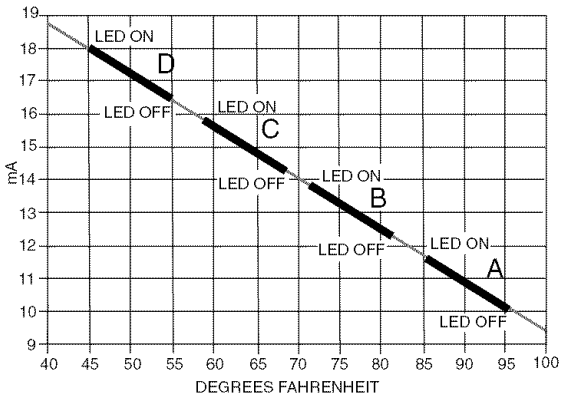


Fig. 15 — Temperature Changeover Set Points

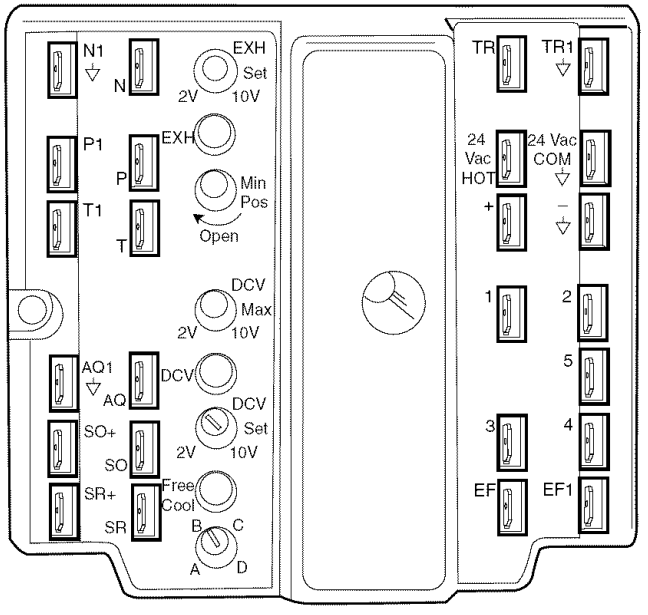


Fig. 16 — EconoMi$er IV Control

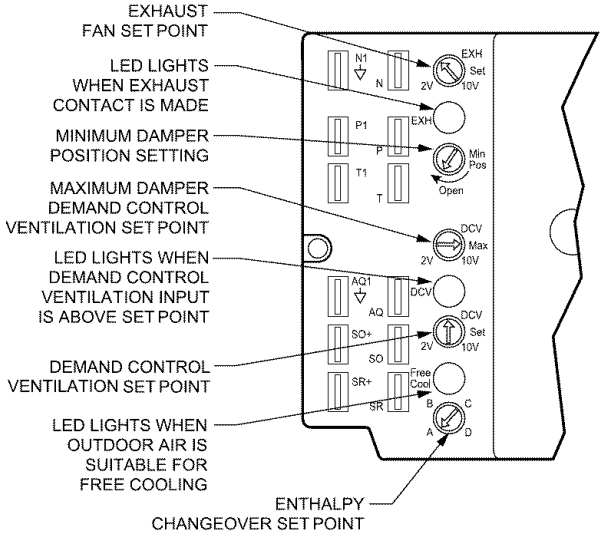


Fig. 17 — EconoMi$er IV Controller Potentiometer and LED Locations

Indoor Air Quality (IAQ) Sensor Input — The IAQ input can be used for demand control ventilation control based on the level of CO_2 measured in the space or return air duct.

Mount the optional IAQ sensor according to manufacturer specifications. The IAQ sensor should be wired to the AQ and AQ1 terminals of the controller. Adjust the DCV potentiometers to correspond to the DCV voltage output of the indoor air quality sensor at the user-determined set point. See Fig. 19.

If a separate field-supplied transformer is used to power the IAQ sensor, the sensor must not be grounded or the EconoMi$er IV control board will be damaged. See Fig. 14.

Power Exhaust — The factory-installed power exhaust will be factory wired and installed. If an accessory power exhaust is to be installed, see the accessory power exhaust installation instructions included with the power exhaust for installation and wiring. The wiring plug on the power exhaust is connected to wiring harness plug PL1-3,4.

Exhaust Set Point Adjustment — The exhaust set point will determine when the exhaust fan runs based on damper position (if accessory power exhaust is installed). The set point is modified with the Exhaust Fan Set Point (EXH SET) potentiometer. The set point represents the damper position above which the exhaust fans will be turned on. When there is a call for exhaust, the EconoMi$er IV controller provides a 45 ± 15 second delay before exhaust fan activation to allow the dampers to open. This delay allows the damper to reach the appropriate position to avoid unnecessary fan overload.

Minimum Position Control — There is a minimum damper position potentiometer on the EconoMi$er IV controller. See Fig. 17. The minimum damper position maintains the minimum airflow into the building during the occupied period.

When using demand ventilation, the minimum damper position represents the minimum ventilation position for VOC (volatile organic compounds) ventilation requirements. The maximum demand ventilation position is used for fully occupied ventilation.

When demand ventilation control is not being used, the minimum position potentiometer should be used to set the occupied ventilation position. The maximum demand ventilation position should be turned fully clockwise.

Adjust the minimum position potentiometer to allow the minimum amount of outdoor air, as required by local codes, to enter the building. Make minimum position adjustments with at least 10° F temperature difference between the outdoor and return-air temperatures.

To determine the minimum position setting, perform the following procedure:

1. Calculate the appropriate mixed air temperature using the following formula:

   $(T_O \times OA) + (T_R \times RA) = T_M$

   T_O = Outdoor-Air Temperature

   OA = Percent of Outdoor Air

   T_R = Return-Air Temperature

   RA = Percent of Return Air

   T_M = Mixed-Air Temperature

   As an example, if local codes require 10% outdoor air during occupied conditions, outdoor-air temperature is 60 F, and return-air temperature is 75 F.

   $(60 \times .10) + (75 \times .90) = 73.5$ F
2. Disconnect the mixed air sensor from terminals T and T1.
3. Ensure that the factory-installed jumper is in place across terminals P and P1. If remote damper positioning is being used, make sure that the terminals are wired according to Fig. 14 and that the minimum position potentiometer is turned fully clockwise.

CONTROL CURVE	CONTROL POINT APPROX. °F (°C) AT 50% RH
A	73 (23)
B	70 (21)
C	67 (19)
D	63 (17)

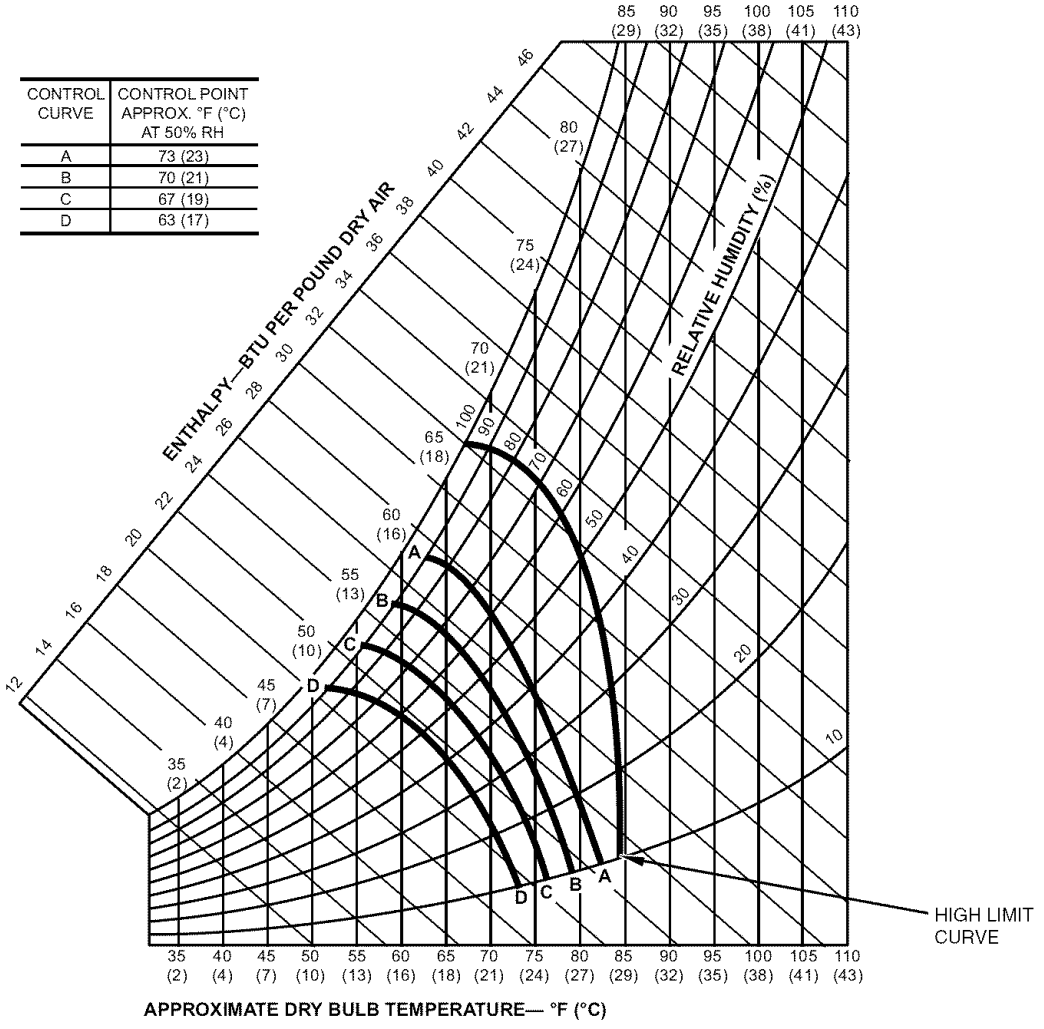


Fig. 18 — Enthalpy Changeover Set Points

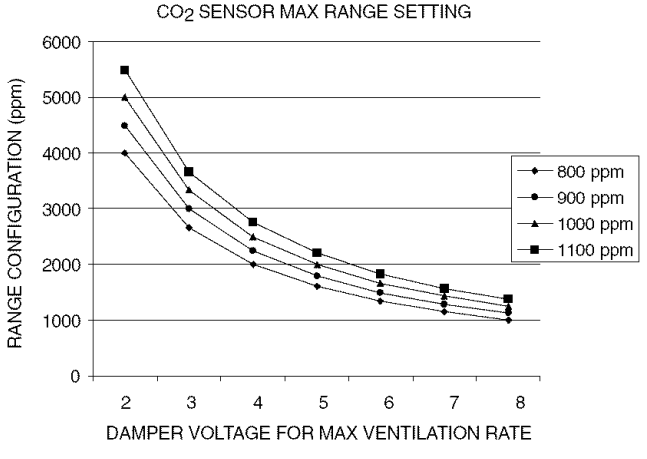


Fig. 19 — CO_2 Sensor Maximum Range Setting

4. Connect 24 vac across terminals TR and TR1.
5. Carefully adjust the minimum position potentiometer until the measured mixed air temperature matches the calculated value.
6. Reconnect the mixed-air sensor to terminals T and T1.

Remote control of the EconoMi$er IV damper is desirable when requiring additional temporary ventilation. If a field-supplied remote potentiometer (Honeywell part number S963B1128) is wired to the EconoMi$er IV controller, the minimum position of the damper can be controlled from a remote location.

To control the minimum damper position remotely, remove the factory-installed jumper on the P and P1 terminals on the EconoMi$er IV controller. Wire the field-supplied potentiometer to the P and P1 terminals on the EconoMi$er IV controller. See Fig. 16.

Damper Movement — When the EconoMi$er IV board receives initial power, it can take the damper up to 2½ minutes before it begins to position itself. After the initial positioning, subsequent changes to damper position will take up to 30 seconds to initiate. Damper movement from full open to full closed (or vice versa) takes 2½ minutes.

Thermostats — The EconoMi$er IV control works with conventional thermostats that have a Y1 (cool stage 1), Y2 (cool stage 2), W1 (heat stage 1), W2 (heat stage 2), and G (fan). The EconoMi$er IV control does not support space temperature sensors. Connections are made at the thermostat terminal connection board located in the main control box.

Pressure Drop — See Fig. 20 and 21 for EconoMi$er IV pressure drop. Evaporator fan may need to be adjusted.

Table 3 — EconoMi$er IV Sensor Usage

APPLICATION	ECONOMI$ER IV WITH OUTDOOR AIR DRY BULB SENSOR			ECONOMI$ER IV WITH SINGLE ENTHALPY SENSOR		
	Accessories Required			Accessories Required		
Outdoor Air Dry Bulb	None. The outdoor air dry bulb sensor is factory installed.			CRTEMPSN002A00*		
Differential Dry Bulb	CRTEMPSN002A00*			(2) CRTEMPSN002A00*		
Single Enthalpy	HH57AC078			None. The single enthalpy sensor is factory installed.		
Differential Enthalpy	HH57AC078 and CRENTDIF004A00*			CRENTDIF004A00*		
CO_2 for DCV Control using a wall-mounted CO_2 sensor	33ZCSENCO2			33ZCSENCO2		
CO_2 for DCV Control using a duct-mounted CO_2 sensor	33ZCSENCO2† and 33ZCASPCO2**	OR	CRCBDIOX005A00††	33ZCSENCO2† and 33ZCASPCO2**	OR	CRCBDIOX005A00††

*CRENTDIF004A00 and CRTEMPSN002A00 accessories are used on many different base units. As such, these kits may contain parts that will not be needed for installation.
†33ZCSENCO2 is an accessory CO_2 sensor.
**33ZCASPCO2 is an accessory aspirator box required for duct-mounted applications.
††CRCBDIOX005A00 is an accessory that contains both 33ZCSENCO2 and 33ZCASPCO2 accessories.

Demand Controlled Ventilation (DCV) — When using the EconoMi$er IV for demand control ventilation, there are some equipment selection criteria which should be considered. When selecting the heat capacity and cool capacity of the equipment, the maximum ventilation rate must be evaluated for design conditions. The maximum damper position must be calculated to provide the desired fresh air.

Typically the maximum ventilation rate will be about 5 to 10% more than the typical cfm required per person, using normal outside air design criteria.

A proportional anticipatory strategy should be taken with the following conditions: a zone with a large area, varied occupancy, and equipment that cannot exceed the required ventilation rate at design conditions. Exceeding the required ventilation rate means the equipment can condition air at a maximum ventilation rate that is greater than the required ventilation rate for maximum occupancy. A proportional-anticipatory strategy will cause the fresh air supplied to increase as the room CO_2 level increases even though the CO_2 set point has not been reached. By the time the CO_2 level reaches the set point, the damper will be at maximum ventilation and should maintain the set point.

In order to have the CO_2 sensor control the economizer damper in this manner, first determine the damper voltage output for minimum or base ventilation. Base ventilation is the ventilation required to remove contaminants during unoccupied periods. The following equation may be used to determine the percent of outside air entering the building for a given damper position. For best results there should be at least a 10 degree difference in outside and return-air temperatures.

$(T_O \times OA) + (T_R \times RA) = T_M$

T_O = Outdoor-Air Temperature

OA = Percent of Outdoor Air

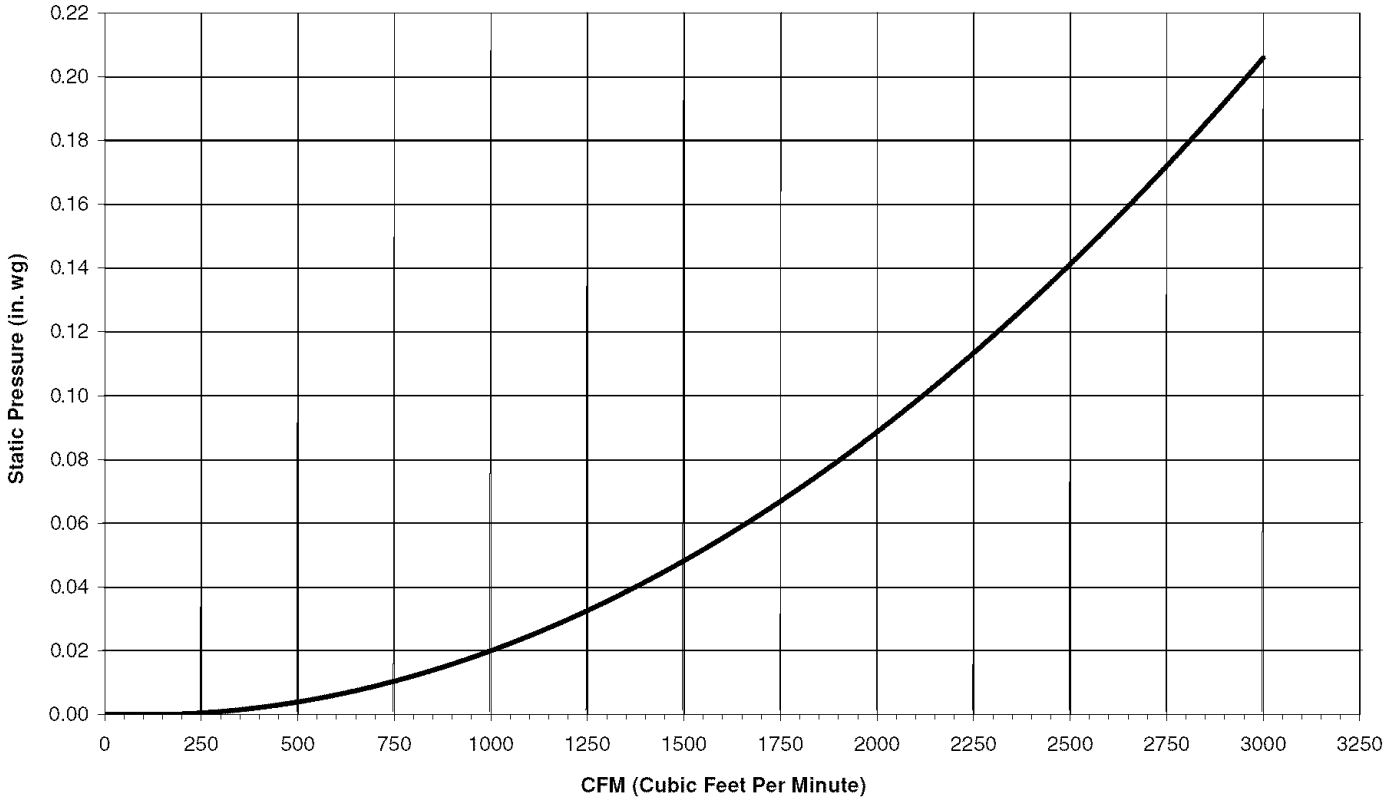
T_R = Return-Air Temperature

RA = Percent of Return Air

T_M = Mixed-Air Temperature

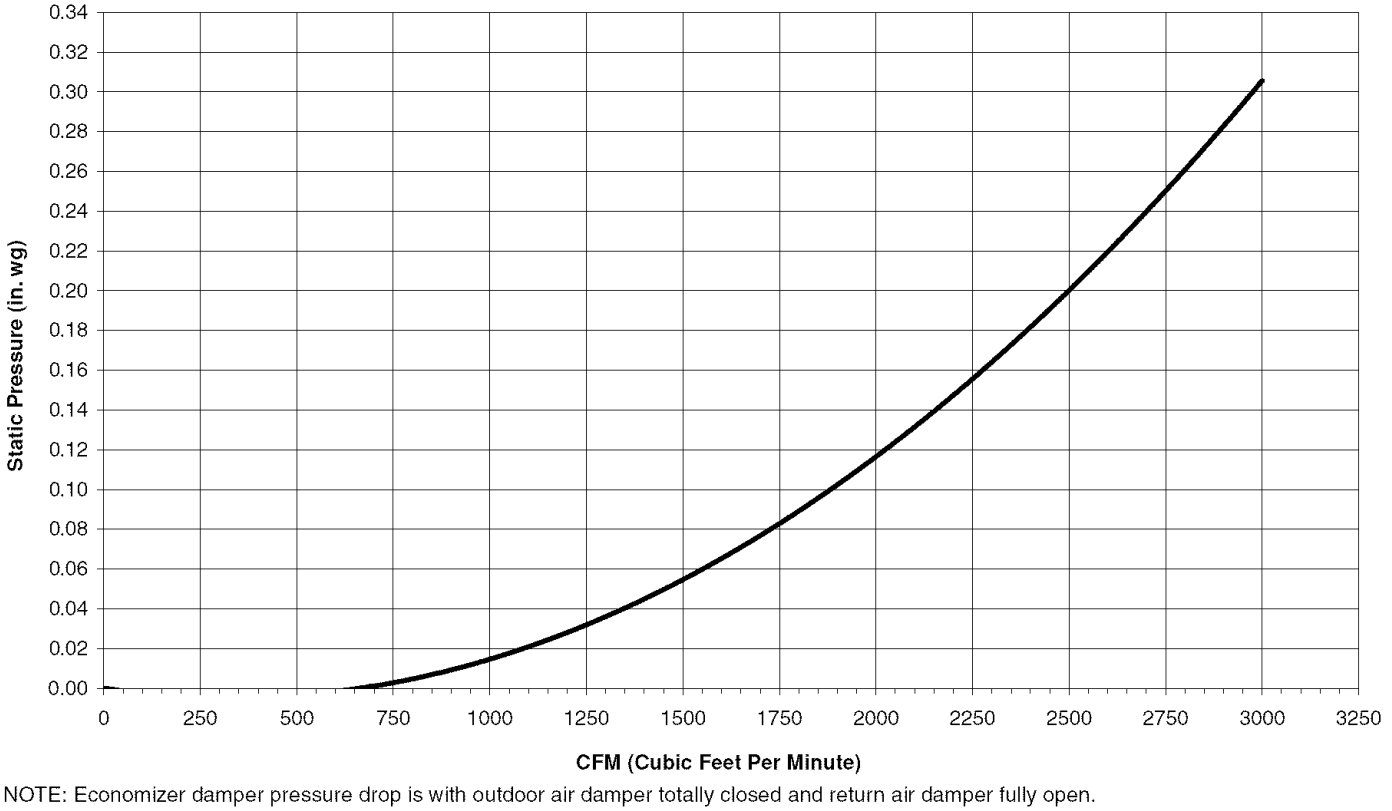
Once base ventilation has been determined, set the minimum damper position potentiometer to the correct position.

The same equation can be used to determine the occupied or maximum ventilation rate to the building. For example, an output of 3.6 volts to the actuator provides a base ventilation rate of 5% and an output of 6.7 volts provides the maximum ventilation rate of 20% (or base plus 15 cfm per person). Use Fig. 19 to determine the maximum setting of the CO_2 sensor. For example, a 1100 ppm set point relates to a 15 cfm per person design. Use the 1100 ppm curve on Fig. 19 to find the point when the CO_2 sensor output will be 6.7 volts. Line up the point on the graph with the left side of the chart to determine that the range configuration for the CO_2 sensor should be 1800 ppm. The EconoMi$er IV controller will output the 6.7 volts from the CO_2 sensor to the actuator when the CO_2 concentration in the space is at 1100 ppm. The DCV set point may be left at 2 volts since the CO_2 sensor voltage will be ignored by the EconoMi$er IV controller until it rises above the 3.6 volt setting of the minimum position potentiometer.



NOTE: Economizer damper pressure drop is with outdoor air damper totally closed and return air damper fully open.

Fig. 20 — Pressure Drop for Vertical Economizer (50PG03-07)



NOTE: Economizer damper pressure drop is with outdoor air damper totally closed and return air damper fully open.

Fig. 21 — Pressure Drop for Horizontal Economizer (50PG03-07)

Once the fully occupied damper position has been determined, set the maximum damper demand control ventilation potentiometer to this position. Do not set to the maximum position as this can result in over-ventilation to the space and potential high humidity levels.

CO_2 Sensor Configuration — The CO_2 sensor has preset standard voltage settings that can be selected anytime after the sensor is powered up. See Table 4.

Use setting 1 or 2 for Carrier equipment.

1. Press Clear and Mode buttons. Hold at least 5 seconds until the sensor enters the Edit mode.
2. Press Mode twice. The STDSET Menu will appear.
3. Use the Up/Down button to select the preset number. See Table 4.
4. Press Enter to lock in the selection.
5. Press Mode to exit and resume normal operation.

The custom settings of the CO_2 sensor can be changed anytime after the sensor is energized. Follow the steps below to change the non-standard settings:

1. Press Clear and Mode buttons. Hold at least 5 seconds until the sensor enters the Edit mode.
2. Press Mode twice. The STDSET Menu will appear.
3. Use the Up/Down button to toggle to the NONSTD menu and press Enter.
4. Use the Up/Down button to toggle through each of the nine variables, starting with Altitude, until the desired setting is reached.
5. Press Mode to move through the variables.
6. Press Enter to lock in the selection, then press Mode to continue to the next variable.

Dehumidification of Fresh Air with DCV (Demand Controlled Ventilation) Control — Information from ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) indicates that the largest humidity load on any zone is the fresh air introduced. For some applications, a device such as a 62AQ energy recovery unit is added to reduce the moisture content of the fresh air being brought into the building when the enthalpy is high. In most cases, the normal heating and cooling processes are more than adequate to remove the humidity loads for most commercial applications.

This makes the control of the of the dehumidification device simple when using the enthalpy or differential enthalpy sensor. The enthalpy sensor or differential enthalpy sensor is installed on the equipment to determine economizer operation. The high enthalpy signal from the enthalpy sensor or differential enthalpy sensor can be used to turn on the outdoor air moisture removal device any time fresh air is required for the space.

The energy recovery device should be sized for maximum latent and sensible conditioning at maximum ventilation on a design day. A calculation for leaving-air temperature on a low ambient, low ventilation day should also be done to determine the mixed-air temperature of the return and pre-conditioned outside air. The design should produce an air temperature somewhat near room conditions to prevent reheat of the air mixture. The energy recovery device should be interlocked with the heat to turn off the device when in the heat mode.

Step 9 — Install All Accessories — After all of the factory-installed options have been adjusted, install all field-installed accessories. Refer to the accessory installation instructions included with each accessory. Consult the Carrier Price Pages or RTU (rooftop unit) Building software for accessory package numbers for particular applications.

Table 4 — CO_2 Sensor Standard Settings

SETTING	EQUIPMENT	OUTPUT	VENTILATION RATE (cfm/Person)	ANALOG OUTPUT	CO_2 CONTROL RANGE (ppm)	OPTIONAL RELAY SETPOINT (ppm)	RELAY HYSTERESIS (ppm)
1	Interface w/Standard Building Control System	Proportional	Any	0-10V 4-20 mA	0-2000	1000	50
2		Proportional	Any	2-10V 7-20 mA	0-2000	1000	50
3		Exponential	Any	0-10V 4-20 mA	0-2000	1100	50
4	Economizer	Proportional	15	0-10V 4-20 mA	0-1100	1100	50
5		Proportional	20	0-10V 4-20 mA	0- 900	900	50
6		Exponential	15	0-10V 4-20 mA	0-1100	1100	50
7		Exponential	20	0-10V 4-20 mA	0- 900	900	50
8	Health & Safety	Proportional	—	0-10V 4-20 mA	0-9999	5000	500
9	Parking/Air Intakes/ Loading Docks	Proportional	—	0-10V 4-20 mA	0-2000	700	50

PRE-START-UP

⚠ WARNING

Failure to observe the following warnings could result in serious personal injury:

1. Follow recognized safety practices and wear protective goggles when checking or servicing refrigerant system.
2. Do not operate compressor or provide any electric power to unit unless compressor terminal cover is in place and secured.
3. Do not remove compressor terminal cover until all electrical sources are disconnected and properly tagged.
4. Relieve all pressure from system before touching or disturbing anything inside terminal box if refrigerant leak is suspected around compressor terminals. Use accepted methods to recover refrigerant.
5. Never attempt to repair soldered connection while refrigerant system is under pressure.
6. Do not use torch to remove any component. System contains oil and refrigerant under pressure. To remove a component, wear protective goggles and proceed as follows:
   a. Shut off electrical power to unit and install lockout tag.
   b. Relieve all pressure from system using both high-and low-pressure ports. Use accepted methods to recover refrigerant.
   c. Cut component connection tubing with tubing cutter and remove component from unit.
   d. Carefully unsweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.

Proceed as follows to inspect and prepare the unit for initial start-up:

1. Remove all access panels.
2. Read and follow instructions on all WARNING, CAUTION, and INFORMATION labels attached to or shipped with unit.
3. Make the following inspections:
   a. Inspect for shipping and handling damages such as broken lines, loose parts, or disconnected wires.
   b. Inspect for oil at all refrigerant tubing connections and on unit base. Detecting oil generally indicates a refrigerant leak. Leak-test all refrigerant tubing connections using electronic leak detector, halide torch, or liquid-soap solution.
   c. Inspect all field-wiring and factory-wiring connections. Be sure that connections are completed and tight.
   d. Inspect coil fins. If damaged during shipping and handling, carefully straighten fins with a fin comb.
4. Verify the following:
   a. Make sure that condenser-fan blades are correctly positioned in fan orifice. Refer to Condenser-Fan Adjustment section on page 39 for more details.
   b. Make sure that air filters are in place.
   c. Make sure that condensate drain trap is filled with water to ensure proper drainage.
   d. Make sure that all tools and miscellaneous loose parts have been removed.
   e. Make sure that the start-up checklist has been performed and filled out.

NOTE: Ensure wiring does not contact any refrigerant tubing.

START-UP

Unit Preparation — Make sure that unit has been installed in accordance with these installation instructions and applicable codes.

Return-Air Filters — Make sure correct filters are installed in unit (see Table 1). Do not operate unit without return-air filters.

Outdoor-Air Inlet Screens — Outdoor-air inlet screens must be in place before operating unit.

Compressor Mounting — Compressors are internally spring mounted. Do not loosen or remove compressor hold-down bolts.

Internal Wiring — Check all electrical connections in unit control boxes; tighten as required.

Refrigerant Service Ports — Each independent refrigerant system has a total of 4 Schrader-type service gage ports per circuit. One port is located on the suction line, one on the compressor discharge line, and 2 on the liquid line on both sides of the filter drier. Be sure that caps on the ports are tight.

Crankcase Heater(s) — Crankcase heaters are energized as long as there is power to the unit, the compressor is not operating, and ambient temperature is below 75 F.

High Flow Refrigerant Valves — Three high flow refrigerant valves are located on the compressor hot gas tube, suction tube, and the liquid line leaving the condenser. Large black plastic caps distinguish these valves with o-rings located inside the caps. These valves can not be accessed for service in the field. Ensure the plastic caps are in place and tight or the possibility of refrigerant leakage could occur.

Compressor Rotation — On 3-phase units, it is important to be certain the scroll compressor is rotating in the proper direction. To determine whether or not compressor is rotating in the proper direction:

1. Connect service gages to suction and discharge pressure fittings.
2. Energize the compressor.
3. The suction pressure should drop and the discharge pressure should rise, as is normal on any start-up.

If the suction pressure does not drop and the discharge pressure does not rise to normal levels:

1. Note that the evaporator fan is probably also rotating in the wrong direction.
2. Turn off power to the unit and install lockout tag.
3. Reverse any two of the unit power leads.
4. Turn on power to the unit.

The suction and discharge pressure levels should now move to their normal start-up levels.

NOTE: When the compressor is rotating in the wrong direction, the unit makes an elevated level of noise and does not provide heating or cooling.

⚠ CAUTION

Compressor damage will occur if rotation is not immediately corrected.

Evaporator Fan — Fan belt and variable pitch pulleys are factory-installed. See Tables 5-14 for fan performance data. Be sure that fans rotate in the proper direction. See Table 15 for air quantity limits. See Table 16 for evaporator fan motor specifications. See Table 17 for fan rpm at various motor pulley settings. To alter fan performance, see Evaporator Fan

Performance Adjustment section on page 39. See Table 18 for accessory electric heat static pressure.

Cooling — To start unit, turn on main power supply. Set system selector switch at COOL position and fan switch at AUTO position. Adjust thermostat to a setting below room temperature. Compressor starts on closure of contactor.

Check unit charge. Refer to Refrigerant Charge section on page 40.

Reset thermostat at a position above room temperature. Compressor will shut off.

TO SHUT OFF UNIT — Set system selector switch at OFF position. Resetting thermostat at a position above room temperature shuts unit off temporarily until space temperature exceeds thermostat setting. Units are equipped with Cycle-LOC™ protection device. Unit shuts down on any safety trip and remains off; an indicator light on the thermostat comes on. Check reason for safety trip.

Compressor restart is accomplished by manual reset at the thermostat by turning the selector switch to OFF position and then ON position.

Heating (If Accessory Heater is Installed) — To start unit, turn on main power supply.

Set thermostat at HEAT position and a setting above room temperature, and set fan at AUTO position.

First stage of thermostat energizes the first-stage electric heater elements; second stage energizes second-stage electric heater elements. Check heating effects at air supply grille(s).

If accessory electric heaters do not energize, reset limit switch (located on evaporator-fan scroll) by pressing button located between terminals on the switch.

TO SHUT OFF UNIT — Set system selector switch at OFF position. Resetting heating selector lever below room temperature temporarily shuts unit off until space temperature falls below thermostat setting.

Safety Relief — A soft solder joint in the suction line at the loss-of-charge/low-pressure switch fitting provides pressure relief under abnormal temperature and pressure conditions.

Ventilation (Continuous Fan) — Set fan and system selector switches at ON and OFF positions, respectively. Evaporator fan operates continuously to provide constant air circulation.

Operating Sequence

COOLING, UNITS WITHOUT ECONOMIZER — When thermostat calls for cooling, terminals G and Y1 are energized. The indoor-fan contactor (IFC) and compressor contactor are energized and indoor-fan motor, compressor, and outdoor fan starts. The outdoor-fan motor runs continuously while unit is cooling.

HEATING, UNITS WITHOUT ECONOMIZER — Upon a request for heating from the space thermostat, terminal W1 will be energized with 24 v. The IFC and heater contactor no. 1 (HC1) are energized.

COOLING, UNITS WITH ECONOMI$ER IV — When free cooling is not available, the compressors will be controlled by the zone thermostat. When free cooling is available, the outdoor-air damper is modulated by the EconoMi$er IV control to provide 50 to 55 F mixed-air temperature into the zone. As the mixed-air temperature fluctuates above 55 or below 50 F, the dampers will be modulated (open or close) to bring the mixed-air temperature back within control.

If the load is high and Y2 is energized, then the first stage of mechanical cooling will be used to supplement the free cooling provided by the economizer. If mechanical cooling is utilized with free cooling, the outdoor-air damper will maintain its current position at the time the compressor is started. If the increase in cooling capacity causes the mixed-air temperature to drop below 45 F, then the outdoor-air damper position will be decreased to the minimum position. If the mixed-air temperature continues to fall, the outdoor-air damper will close. Control returns to normal once the mixed air temperature rises above 48 F.

If optional power exhaust is installed, as the outdoor-air damper opens and closes, the power exhaust fans will be energized and deenergized if the position goes above or below the power exhaust set point. When the exhaust fan is required to be on, the LED on the control will be energized.

If field-installed accessory CO_2 sensors are connected to the EconoMi$er IV control, a demand controlled ventilation strategy will begin to operate. As the CO_2 level in the zone increases above the CO_2 set point, the minimum position of the damper will be increased proportionally from the minimum damper position to the maximum demand ventilation damper position. As the CO_2 level decreases because of the increase in fresh air, the outdoor-air damper will be proportionally closed.

If there is no G signal then the control will drive the damper to the fully closed position.

The control is also equipped with an occupied/unoccupied input. If the input is closed, then the damper will be driven to the minimum position when G is energized. If the input is open then the damper will remain in the fully closed position unless there is a demand for free cooling of DCV ventilation.

On the initial power to the EconoMi$er IV control, it will take the damper up to $2^1/_2$ minutes before it begins to position itself. Any change in damper position will take up to 30 seconds to initiate. Damper movement from full closed to full open (or vice versa) will take between $1^1/_2$ to $2^1/_2$ minutes.

If free cooling can be used as determined from the appropriate changeover command (switch, dry bulb, enthalpy curve, differential dry bulb, or differential enthalpy), then the control will modulate the dampers open to maintain the mixed air temperature set point at 50 to 55 F.

If there is a further demand for cooling (cooling second stage — Y2 is energized), then the control will bring on compressor stage 1 to maintain the mixed air temperature set point. The EconoMi$er IV damper will be open at maximum position. EconoMi$er IV operation is limited to a single compressor.

HEATING, UNITS WITH ECONOMI$ER IV — When the room temperature calls for heat, the heating controls are energized as described in the Heating, Units Without Economizer section. The IFM is energized and the EconoMi$er IV damper modulates to the minimum position. When the thermostat is satisfied, the damper modulates closed.

Table 5 — Fan Performance — 50PG03 Vertical Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
600	402	0.05	549	0.10	664	0.15	761	0.21	847	0.27
650	407	0.06	553	0.11	667	0.17	764	0.23	850	0.29
700	413	0.06	556	0.12	670	0.18	767	0.24	853	0.31
750	418	0.07	560	0.13	673	0.19	770	0.25	856	0.32
800	425	0.07	565	0.13	677	0.20	773	0.27	859	0.34
850	431	0.08	569	0.14	681	0.21	776	0.28	862	0.36
900	438	0.09	574	0.15	685	0.23	780	0.30	865	0.38
950	446	0.10	579	0.17	689	0.24	784	0.32	868	0.40
1000	454	0.11	585	0.18	693	0.25	787	0.33	872	0.42

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
600	925	0.34	997	0.41	1064	0.48	1126	0.55	1186	0.63
650	928	0.36	999	0.43	1066	0.50	1129	0.58	1188	0.66
700	930	0.38	1002	0.45	1069	0.53	1131	0.61	1191	0.69
750	933	0.40	1005	0.47	1071	0.55	1134	0.63	1193	0.72
800	936	0.42	1007	0.49	1074	0.58	1136	0.66	1196	0.75
850	939	0.44	1010	0.52	1077	0.60	1139	0.69	1198	0.78
900	942	0.46	1013	0.54	1079	0.63	1142	0.72	1201	0.81
950	945	0.48	1016	0.57	1082	0.66	1145	0.75	1204	0.84
1000	948	0.50	1019	0.59	1085	0.68	1147	0.78	1206	0.87

LEGEND

Bhp — Brake Horsepower

Field-Supplied Motor Required

NOTES:
1. Motor drive range is 482 to 736 rpm for low range motor/drive and 656 to 1001 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 0.85 for low range motor/drive and 0.85 for high range motor/drive.
3. See page 35 for General Fan Performance Notes.

Table 6 — Fan Performance — 50PG04 Vertical Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
900	438	0.09	574	0.15	685	0.23	780	0.30	865	0.38
950	446	0.10	579	0.17	689	0.24	784	0.32	868	0.40
1000	454	0.11	585	0.18	693	0.25	787	0.33	872	0.42
1050	462	0.12	590	0.19	698	0.27	791	0.35	875	0.44
1100	471	0.13	596	0.20	703	0.28	796	0.37	879	0.46
1150	480	0.14	603	0.21	708	0.30	800	0.39	883	0.48
1200	489	0.15	610	0.23	713	0.32	805	0.41	887	0.50
1250	499	0.16	617	0.24	719	0.33	809	0.43	891	0.53
1300	509	0.18	624	0.26	725	0.35	814	0.45	896	0.55
1350	519	0.19	632	0.28	731	0.37	820	0.47	900	0.57
1400	529	0.21	639	0.29	737	0.39	825	0.49	905	0.60
1450	540	0.22	648	0.31	744	0.41	831	0.52	910	0.63
1500	551	0.24	656	0.33	751	0.43	837	0.54	915	0.65

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
900	942	0.46	1013	0.54	1079	0.63	1142	0.72	1201	0.81
950	945	0.48	1016	0.57	1082	0.66	1145	0.75	1204	0.84
1000	948	0.50	1019	0.59	1085	0.68	1147	0.78	1206	0.87
1050	952	0.53	1022	0.62	1088	0.71	1150	0.81	1209	0.91
1100	955	0.55	1026	0.65	1091	0.74	1153	0.84	1212	0.94
1150	959	0.57	1029	0.67	1095	0.77	1157	0.87	1215	0.98
1200	962	0.60	1032	0.70	1098	0.80	1160	0.91	1218	1.01
1250	966	0.63	1036	0.73	1101	0.83	1163	0.94	1221	1.05
1300	970	0.65	1040	0.76	1105	0.87	1166	0.98	1225	1.09
1350	975	0.68	1044	0.79	1109	0.90	1170	1.01	1228	1.13
1400	979	0.71	1048	0.82	1112	0.93	1173	1.05	1232	1.17
1450	984	0.74	1052	0.85	1116	0.97	1177	1.09	1235	1.21
1500	988	0.77	1056	0.88	1120	1.00	1181	1.13	1239	1.25

LEGEND

Bhp — Brake Horsepower

Field-Supplied Motor Required

NOTES:
1. Motor drive range is 482 to 736 rpm for low range motor/drive and 796 to 1128 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 0.85 for low range motor/drive and 0.85 for high range motor/drive.
3. See page 35 for General Fan Performance Notes.

Table 7 — Fan Performance — 50PG05 Vertical Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
1200	492	0.15	604	0.22	701	0.31	790	0.39	873	0.49
1300	513	0.18	620	0.26	714	0.34	800	0.43	880	0.53
1400	534	0.21	638	0.29	729	0.38	812	0.48	889	0.58
1500	557	0.24	657	0.33	745	0.43	825	0.53	900	0.63
1600	580	0.28	677	0.38	762	0.48	839	0.58	912	0.69
1700	603	0.33	697	0.43	779	0.53	855	0.64	926	0.75
1800	627	0.38	718	0.48	798	0.59	871	0.70	940	0.82
1900	651	0.43	739	0.54	817	0.65	889	0.77	956	0.89
2000	675	0.49	761	0.61	837	0.72	907	0.85	972	0.97

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
1200	950	0.58	1023	0.69	1092	0.79	1157	0.90	1219	1.02
1300	955	0.63	1027	0.74	1094	0.85	1158	0.96	1220	1.08
1400	962	0.68	1032	0.79	1098	0.91	1161	1.03	1222	1.15
1500	971	0.74	1039	0.85	1103	0.97	1165	1.09	1225	1.22
1600	981	0.80	1047	0.92	1110	1.04	1171	1.17	1229	1.30
1700	993	0.87	1057	0.99	1118	1.11	1178	1.24	1235	1.38
1800	1005	0.94	1068	1.06	1128	1.19	1186	1.33	1242	1.46
1900	1019	1.02	1080	1.14	1139	1.28	1196	1.41	1251	1.56
2000	1034	1.10	1094	1.23	1151	1.37	1206	1.51	1260	1.65

LEGEND

Bhp — Brake Horsepower

High Range Motor/Drive Required

Field-Supplied Motor Required (Single Phase)

NOTES:

1. Motor drive range is 596 to 910 rpm for low range motor/drive and 828 to 1173 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 0.85 for low range motor/drive and 1.60 (single phase) and 2.40 (3 phase) for high range motor/drive.
3. See page 35 for General Fan Performance Notes.

Table 8 — Fan Performance — 50PG06 Vertical Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
1500	568	0.25	667	0.34	753	0.44	833	0.54	908	0.64
1600	592	0.29	687	0.39	771	0.49	848	0.59	920	0.70
1700	616	0.34	708	0.44	789	0.54	864	0.65	934	0.76
1800	641	0.39	730	0.50	809	0.61	881	0.72	950	0.83
1900	665	0.45	752	0.56	829	0.67	900	0.79	966	0.91
2000	690	0.51	775	0.63	850	0.75	918	0.87	983	0.99
2100	716	0.57	798	0.70	871	0.82	938	0.95	1001	1.08
2200	742	0.65	821	0.78	892	0.91	958	1.04	1020	1.18
2300	768	0.73	845	0.86	915	1.00	979	1.14	1039	1.28
2400	794	0.81	869	0.96	937	1.10	1000	1.24	1059	1.38
2500	820	0.91	894	1.05	960	1.20	1021	1.35	1079	1.50

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
1500	978	0.75	1046	0.87	1110	0.98	1172	1.11	1231	1.23
1600	989	0.81	1055	0.93	1117	1.05	1178	1.18	1236	1.31
1700	1001	0.88	1065	1.00	1126	1.13	1185	1.26	1242	1.39
1800	1015	0.96	1077	1.08	1136	1.21	1194	1.35	1250	1.48
1900	1029	1.04	1090	1.16	1148	1.30	1204	1.44	1259	1.58
2000	1045	1.12	1104	1.26	1161	1.39	1216	1.53	1269	1.68
2100	1061	1.21	1119	1.35	1174	1.49	1228	1.64	1280	1.79
2200	1078	1.31	1135	1.45	1189	1.60	1241	1.75	1293	1.90
2300	1096	1.42	1151	1.57	1204	1.71	1256	1.87	1306	2.02
2400	1115	1.53	1169	1.68	1221	1.84	1271	1.99	1320	2.15
2500	1134	1.65	1187	1.81	1238	1.97	1287	2.13	1335	2.29

LEGEND

Bhp — Brake Horsepower

Field-Supplied Motor Required (Single Phase)

NOTES:

1. Motor drive range is 690 to 978 rpm for low range motor/drive and 929 to 1261 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 0.85 (single phase) and 2.40 (3 phase) for low range motor/drive and 1.60 (single phase) and 2.40 (3 phase) for high range motor/drive.
3. See page 35 for General Fan Performance Notes.

Table 9 — Fan Performance — 50PG07 Vertical Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
1800	654	0.41	742	0.51	819	0.62	891	0.73	959	0.85
1900	680	0.46	765	0.58	840	0.69	910	0.81	976	0.93
2000	706	0.53	788	0.65	862	0.77	930	0.89	994	1.01
2100	732	0.60	812	0.72	883	0.85	950	0.97	1012	1.10
2200	758	0.67	836	0.80	906	0.93	970	1.07	1031	1.20
2300	785	0.76	860	0.89	929	1.03	992	1.17	1051	1.31
2400	812	0.85	885	0.99	952	1.13	1014	1.27	1072	1.42
2500	839	0.94	910	1.09	975	1.24	1036	1.39	1093	1.54
2600	866	1.05	936	1.20	999	1.36	1058	1.51	1114	1.66
2700	894	1.16	961	1.32	1023	1.48	1081	1.64	1136	1.80
2800	921	1.28	987	1.45	1048	1.61	1105	1.78	1158	1.94
2900	949	1.41	1013	1.58	1073	1.75	1128	1.92	1181	2.10
3000	977	1.54	1039	1.72	1098	1.90	1152	2.08	1204	2.26

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
1800	1023	0.97	1085	1.10	1145	1.23	1202	1.36	1258	1.50
1900	1039	1.06	1099	1.19	1157	1.32	1213	1.46	1267	1.60
2000	1055	1.14	1113	1.28	1170	1.42	1225	1.56	1278	1.70
2100	1072	1.24	1129	1.38	1184	1.52	1238	1.67	1290	1.81
2200	1090	1.34	1145	1.48	1199	1.63	1252	1.78	1303	1.93
2300	1108	1.45	1163	1.60	1215	1.75	1267	1.90	1316	2.06
2400	1127	1.57	1181	1.72	1232	1.87	1282	2.03	1331	2.19
2500	1147	1.69	1199	1.85	1250	2.01	1299	2.17	1347	2.33
2600	1168	1.82	1219	1.98	1268	2.15	1316	2.31	—	—
2700	1188	1.96	1239	2.13	1287	2.30	—	—	—	—
2800	1210	2.11	1259	2.28	—	—	—	—	—	—
2900	1231	2.27	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:
1. Motor drive range is 796 to 1128 rpm for low range motor/drive and 1150 to 1438 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 2.40 for low range motor/drive and 3.10 for high range motor/drive.
3. See page 35 for General Fan Performance Notes.

Table 10 — Fan Performance — 50PG03 Horizontal Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
600	382	0.05	527	0.09	641	0.14	738	0.20	824	0.26
650	386	0.05	529	0.10	643	0.15	739	0.21	825	0.27
700	390	0.06	532	0.11	644	0.16	741	0.22	826	0.28
750	395	0.06	534	0.11	646	0.17	742	0.23	827	0.30
800	401	0.07	537	0.12	648	0.18	744	0.25	828	0.31
850	407	0.07	541	0.13	651	0.19	746	0.26	830	0.33
900	413	0.08	544	0.14	653	0.20	748	0.27	832	0.35
950	420	0.09	549	0.15	656	0.22	750	0.29	833	0.36
1000	427	0.09	553	0.16	659	0.23	752	0.30	835	0.38

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
600	902	0.32	973	0.38	1040	0.45	1102	0.52	1162	0.60
650	902	0.33	974	0.40	1040	0.47	1103	0.55	1162	0.62
700	903	0.35	975	0.42	1041	0.49	1104	0.57	1163	0.65
750	904	0.37	976	0.44	1042	0.52	1104	0.59	1164	0.67
800	906	0.39	977	0.46	1043	0.54	1105	0.62	1164	0.70
850	907	0.40	978	0.48	1044	0.56	1106	0.64	1165	0.73
900	908	0.42	979	0.50	1045	0.58	1107	0.67	1166	0.75
950	910	0.44	980	0.52	1046	0.61	1108	0.69	1167	0.78
1000	912	0.46	982	0.54	1048	0.63	1110	0.72	1168	0.81

LEGEND

Bhp — Brake Horsepower

NOTES:
1. Motor drive range is 482 to 736 rpm for low range motor/drive and 656 to 1001 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 0.85 for low range motor/drive and 0.85 for high range motor/drive.
3. See page 35 for General Fan Performance Notes.

Table 11 — Fan Performance — 50PG04 Horizontal Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
900	413	0.08	544	0.14	653	0.20	748	0.27	832	0.35
950	420	0.09	549	0.15	656	0.22	750	0.29	833	0.36
1000	427	0.09	553	0.16	659	0.23	752	0.30	835	0.38
1050	435	0.10	558	0.17	663	0.24	755	0.32	838	0.40
1100	443	0.11	563	0.18	667	0.25	758	0.33	840	0.42
1150	451	0.12	569	0.19	671	0.27	761	0.35	843	0.43
1200	460	0.13	575	0.20	675	0.28	764	0.37	846	0.45
1250	469	0.14	581	0.22	680	0.30	768	0.38	849	0.47
1300	478	0.16	587	0.23	685	0.31	772	0.40	852	0.49
1350	488	0.17	594	0.25	690	0.33	776	0.42	855	0.51
1400	498	0.18	602	0.26	695	0.35	781	0.44	859	0.54
1450	508	0.20	609	0.28	701	0.37	785	0.46	863	0.56
1500	518	0.21	617	0.30	707	0.39	790	0.48	867	0.58

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
900	908	0.42	979	0.50	1045	0.58	1107	0.67	1166	0.75
950	910	0.44	980	0.52	1046	0.61	1108	0.69	1167	0.78
1000	912	0.46	982	0.54	1048	0.63	1110	0.72	1168	0.81
1050	913	0.48	983	0.57	1049	0.66	1111	0.75	1169	0.84
1100	915	0.50	985	0.59	1051	0.68	1112	0.77	1171	0.87
1150	918	0.52	987	0.61	1052	0.71	1114	0.80	1172	0.90
1200	920	0.54	989	0.64	1054	0.73	1115	0.83	1174	0.93
1250	923	0.57	992	0.66	1056	0.76	1117	0.86	1175	0.96
1300	925	0.59	994	0.69	1058	0.79	1119	0.89	1177	1.00
1350	928	0.61	997	0.71	1061	0.82	1121	0.92	1179	1.03
1400	932	0.64	999	0.74	1063	0.85	1123	0.95	1181	1.06
1450	935	0.66	1002	0.77	1066	0.88	1126	0.99	1183	1.10
1500	938	0.69	1005	0.80	1068	0.91	1128	1.02	1185	1.13

LEGEND

Bhp — Brake Horsepower

Field-Supplied Motor Required

NOTES:
1. Motor drive range is 482 to 736 rpm for low range motor/drive and 796 to 1128 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 0.85 for low range motor/drive and 0.85 for high range motor/drive.
3. See page 35 for General Fan Performance Notes.

Table 12 — Fan Performance — 50PG05 Horizontal Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
1200	422	0.11	548	0.19	652	0.26	745	0.35	831	0.44
1300	439	0.13	561	0.21	662	0.29	752	0.38	835	0.47
1400	457	0.16	577	0.24	674	0.33	761	0.42	842	0.51
1500	477	0.19	593	0.27	688	0.37	773	0.46	851	0.56
1600	498	0.22	611	0.31	704	0.41	786	0.51	862	0.61
1700	521	0.25	630	0.35	720	0.46	801	0.56	875	0.67
1800	545	0.29	650	0.40	738	0.51	817	0.62	889	0.73
1900	569	0.34	672	0.45	757	0.57	834	0.68	904	0.80
2000	595	0.39	694	0.51	777	0.63	852	0.75	921	0.87

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
1200	911	0.53	986	0.63	1056	0.74	1123	0.85	1187	0.96
1300	913	0.57	986	0.68	1056	0.78	1122	0.90	1185	1.01
1400	918	0.62	989	0.72	1058	0.84	1123	0.95	1185	1.07
1500	925	0.67	995	0.78	1061	0.89	1125	1.01	1186	1.14
1600	934	0.72	1002	0.84	1067	0.95	1129	1.08	1189	1.21
1700	944	0.78	1010	0.90	1074	1.02	1135	1.15	1194	1.28
1800	956	0.85	1021	0.97	1083	1.09	1143	1.23	1200	1.36
1900	970	0.92	1033	1.04	1094	1.17	1152	1.31	1208	1.45
2000	985	1.00	1047	1.13	1106	1.26	1162	1.40	1217	1.54

LEGEND

Bhp — Brake Horsepower

High Range Motor/Drive Required

NOTES:
1. Motor drive range is 596 to 910 rpm for low range motor/drive and 828 to 1173 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 0.85 for low range motor/drive and 1.60 (single phase) and 2.40 (3 phase) for high range motor/drive.
3. See page 35 for General Fan Performance Notes.

Table 13 — Fan Performance — 50PG06 Horizontal Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
1500	491	0.19	604	0.28	697	0.37	781	0.47	859	0.57
1600	513	0.23	623	0.32	714	0.42	795	0.52	871	0.62
1700	537	0.27	643	0.37	731	0.47	810	0.57	884	0.68
1800	561	0.31	664	0.42	750	0.52	827	0.63	899	0.75
1900	586	0.36	686	0.47	770	0.58	845	0.70	915	0.82
2000	613	0.41	709	0.53	790	0.65	864	0.77	932	0.89
2100	640	0.47	732	0.60	812	0.72	884	0.85	950	0.97
2200	667	0.54	757	0.67	834	0.80	904	0.93	969	1.06
2300	695	0.61	782	0.75	857	0.89	926	1.02	989	1.16
2400	724	0.69	807	0.84	881	0.98	948	1.12	1010	1.26
2500	753	0.78	833	0.93	905	1.08	971	1.23	1032	1.38

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
1500	932	0.68	1002	0.79	1068	0.91	1132	1.03	1192	1.15
1600	942	0.73	1009	0.85	1074	0.97	1136	1.09	1196	1.22
1700	953	0.80	1019	0.91	1082	1.04	1143	1.17	1201	1.30
1800	966	0.86	1030	0.99	1092	1.11	1151	1.24	1208	1.38
1900	980	0.94	1043	1.06	1103	1.19	1161	1.33	1217	1.47
2000	996	1.02	1057	1.15	1115	1.28	1172	1.42	1227	1.56
2100	1012	1.11	1072	1.24	1129	1.38	1184	1.52	1238	1.67
2200	1030	1.20	1088	1.34	1144	1.48	1198	1.63	1251	1.78
2300	1049	1.30	1106	1.44	1160	1.59	1213	1.74	1265	1.89
2400	1068	1.41	1124	1.56	1178	1.71	1229	1.86	1279	2.02
2500	1089	1.53	1143	1.68	1196	1.84	1246	1.99	1295	2.16

LEGEND

Bhp — Brake Horsepower

High Range Motor/Drive Required

Field-Supplied Motor Required (Single Phase)

NOTES:
1. Motor drive range is 690 to 978 rpm for low range motor/drive and 929 to 1261 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 0.85 (single phase) and 2.40 (3 phase) for low range motor/drive and 1.60 (single phase) and 2.40 (3 phase) for high range motor/drive.
3. See below for General Fan Performance Notes.

Table 14 — Fan Performance — 50PG07 Horizontal Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
1800	577	0.32	677	0.43	761	0.54	838	0.65	908	0.76
1900	603	0.38	700	0.49	782	0.60	856	0.72	925	0.83
2000	630	0.43	723	0.55	803	0.67	876	0.79	943	0.91
2100	658	0.49	748	0.62	826	0.74	896	0.87	962	1.00
2200	686	0.56	773	0.70	849	0.83	918	0.96	981	1.09
2300	715	0.64	798	0.78	872	0.92	940	1.05	1002	1.19
2400	744	0.72	825	0.87	897	1.01	963	1.15	1024	1.30
2500	773	0.82	852	0.97	922	1.12	986	1.26	1046	1.41
2600	803	0.92	879	1.07	947	1.23	1010	1.38	1069	1.54
2700	834	1.03	907	1.19	974	1.35	1035	1.51	1092	1.67
2800	864	1.14	935	1.31	1000	1.48	1060	1.65	1116	1.81
2900	895	1.27	964	1.45	1027	1.62	1086	1.79	1141	1.96
3000	927	1.41	993	1.59	1055	1.77	1112	1.95	1165	2.12

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
1800	975	0.88	1039	1.00	1100	1.13	1159	1.26	1216	1.40
1900	990	0.96	1052	1.08	1112	1.21	1169	1.35	1225	1.49
2000	1006	1.04	1067	1.17	1125	1.31	1181	1.44	1236	1.59
2100	1024	1.13	1083	1.26	1139	1.40	1194	1.55	1248	1.69
2200	1042	1.23	1100	1.37	1155	1.51	1209	1.66	1261	1.81
2300	1061	1.33	1118	1.47	1172	1.62	1224	1.77	1275	1.93
2400	1081	1.44	1137	1.59	1190	1.74	1241	1.90	1291	2.06
2500	1102	1.56	1156	1.72	1208	1.87	1258	2.03	1307	2.20
2600	1124	1.69	1177	1.85	1228	2.01	1277	2.18	1325	2.34
2700	1146	1.83	1198	1.99	1248	2.16	1296	2.33	—	—
2800	1169	1.98	1220	2.15	1269	2.32	—	—	—	—
2900	1193	2.14	1242	2.31	—	—	—	—	—	—
3000	1217	2.30	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:
1. Motor drive range is 796 to 1128 rpm for low range motor/drive and 1150 to 1438 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 2.40 for low range motor/drive and 3.10 for high range motor/drive.
3. See below for General Fan Performance Notes.

GENERAL NOTES FOR FAN PERFORMANCE DATA TABLES

1. Static pressure losses (i.e., economizer, electric heat, etc.) must be added to external static pressure before entering Fan Performance table.
2. Interpolation is permissible. Do not extrapolate.
3. Fan performance is based on wet coils, clean filters, and casing losses. See Accessory/FIOP Static Pressure information in Fig. 20 and 21 and Table 18.
4. Extensive motor and drive testing on these units ensures that the full horsepower range of the motor can be utilized with confidence. Using the fan motors up to the bhp rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
5. Use of a field-supplied motor may affect wire size. Recalculate the unit power supply MCA and MOCP if required. Contact the local Carrier representative for details.
6. Use the following formula to calculate input watts:

   Input Watts = Bhp x (746/Motor Eff)

Table 15 — Operation Air Quantity Limits

UNIT 50PG	COOLING (cfm)		HEATING (cfm) ELECTRIC HEAT	
	Min	Max	Min	Max
03	600	1000	600	1000
04	900	1500	900	1500
05	1200	2000	1200	2000
06	1500	2500	1500	2500
07	1800	3000	1800	3000

Table 16 — Evaporator Fan Motor Specifications

50PG	DRIVE	VOLTAGE/PHASE	MOTOR P/N	EFFICIENCY	MAX BHP	MAX AMPS
03	Low	208/1ph	HC52EE208	0.73	0.85	4.0
		230/1ph	HC52EE208	0.73	0.85	4.0
	High	208/1ph	HC52EE208	0.73	0.85	4.0
		230/1ph	HC52EE208	0.73	0.85	4.0
04	Low	208/1ph	HC52EE208	0.73	0.85	4.0
		230/1ph	HC52EE208	0.73	0.85	4.0
		208/3ph	HC52EE208	0.73	0.85	4.0
		230/3ph	HC52EE208	0.73	0.85	4.0
		460/3ph	HC52EE460	0.73	0.85	2.0
		575/3ph	HC52EE576	0.73	0.85	1.6
	High	208/1ph	HC52EE208	0.73	0.85	4.0
		230/1ph	HC52EE208	0.73	0.85	4.0
		208/3ph	HC52EE208	0.73	0.85	4.0
		230/3ph	HC52EE208	0.73	0.85	4.0
		460/3ph	HC52EE460	0.73	0.85	2.0
		575/3ph	HC52EE576	0.73	0.85	1.6
05	Low	208/1ph	HC52EE208	0.73	0.85	4.0
		230/1ph	HC52EE208	0.73	0.85	4.0
		208/3ph	HC52EE208	0.73	0.85	4.0
		230/3ph	HC52EE208	0.73	0.85	4.0
		460/3ph	HC52EE460	0.73	0.85	2.0
		575/3ph	HC52EE576	0.73	0.85	1.6
	High	208/1ph	HC54FB230	0.78	1.6	8.3
		230/1ph	HC54FB230	0.78	1.6	8.3
		208/3ph	HD56FE652	0.80	2.4	6.4
		230/3ph	HD56FE652	0.80	2.4	6.4
		460/3ph	HD56FE652	0.80	2.4	3.2
		575/3ph	HD56FE575	0.80	2.4	2.4
06	Low	208/1ph	HC52EE208	0.73	0.85	4.0
		230/1ph	HC52EE208	0.73	0.85	4.0
		208/3ph	HD56FE652	0.80	2.4	6.4
		230/3ph	HD56FE652	0.80	2.4	6.4
		460/3ph	HD56FE652	0.80	2.4	3.2
		575/3ph	HD56FE575	0.80	2.4	2.4
	High	208/1ph	HC54FB230	0.78	1.6	8.3
		230/1ph	HC54FB230	0.78	1.6	8.3
		208/3ph	HD56FE652	0.80	2.4	6.4
		230/3ph	HD56FE652	0.80	2.4	6.4
		460/3ph	HD56FE652	0.80	2.4	3.2
		575/3ph	HD56FE575	0.80	2.4	2.4
07	Low	208/3ph	HD56FE652	0.80	2.4	6.4
		230/3ph	HD56FE652	0.80	2.4	6.4
		460/3ph	HD56FE652	0.80	2.4	3.2
		575/3ph	HD56FE575	0.80	2.4	2.4
	High	208/3ph	HD58FE653	0.84	3.1	8.8
		230/3ph	HD58FE653	0.84	3.1	8.8
		460/3ph	HD58FE653	0.84	3.1	4.4
		575/3ph	HD58FE576	0.84	3.1	3.9

NOTES:
1. Extensive motor and electrical testing ensures that the motors can be utilized with confidence up to the maximum applied bhp, watts, and amps. Using the fan motor up to the maximum ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
2. Convert bhp to watts using the following formula:

$$\text{watts} = \frac{\text{bhp (746)}}{\text{motor efficiency}}$$

3. The EPACT (Energy Policy Act of 1992) regulates energy requirements for specific types of indoor fan motors. Motors regulated by EPACT include any general purpose, T-frame (three-digit, 143 and larger), single-speed, foot mounted, polyphase, squirrel cage induction motors of NEMA (National Electrical Manufacturers Association) design A and B, manufactured for use in the United States. Ranging from 1 to 200 Hp, these continuous-duty motors operate on 230 and 460 volt, 60 Hz power. If a motor does not fit into these specifications, the motor does not have to be replaced by an EPACT-compliant energy-efficient motor. Variable-speed motors are exempt from EPACT compliance requirements. Therefore, the indoor fan motors for Carrier 50PG03-07 units are exempt from these requirements.

Table 17 — Fan Rpm at Motor Pulley Settings*

UNIT 50PG	DRIVE	MOTOR PULLEY TURNS OPEN										
		0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5
03	Low	736	710	685	660	634	609	583	558	533	507	482
	High	1001	966	932	897	863	828	794	759	725	690	656
04	Low	736	710	685	660	634	609	583	558	533	507	482
	High	1128	1095	1062	1028	995	962	929	896	863	829	796
05	Low	910	878	847	815	784	753	721	690	659	627	596
	High	1173	1139	1104	1070	1035	1001	966	932	897	863	828
06	Low	978	949	920	891	863	834	805	776	748	719	690
	High	1261	1227	1194	1161	1128	1095	1062	1028	995	962	929
07	Low	1128	1095	1062	1028	995	962	929	896	863	829	796
	High	1438	1409	1380	1351	1323	1294	1265	1236	1208	1179	1150

*Approximate fan rpm shown, based on 1725 rpm motor.

NOTE: Factory pulley speed setting is at 5 turns open.

Table 18 — Accessory/FIOP Electric Heat Static Pressure (in. wg)

AIRFLOW (Cfm)	PRESSURE DROP (in. wg)
600	0.01
800	0.01
1000	0.02
1200	0.02
1400	0.03
1600	0.04
1800	0.05
2000	0.07
2200	0.08
2400	0.10
2600	0.11
2800	0.13
3000	0.15

SERVICE

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury.

⚠ CAUTION

Puron® (R-410A) refrigerant systems operate at higher pressures than standard R-22 systems. Do not use R-22 service equipment or components on Puron refrigerant equipment. If service equipment is not rated for Puron refrigerant, equipment damage or personal injury may result.

Cleaning — Inspect unit interior at beginning of each heating and cooling season and as operating conditions require. Remove unit top panel and/or side panels for access to unit interior.

COIL MAINTENANCE AND CLEANING RECOMMENDATION — Routine cleaning of coil surfaces is essential to maintain proper operation of the unit. Elimination of contamination and removal of harmful residues will greatly increase the life of the coil and extend the life of the unit. The following maintenance and cleaning procedures are recommended as part of the routine maintenance activities to extend the life of the coil.

Remove Surface Loaded Fibers — Surface loaded fibers or dirt should be removed with a vacuum cleaner. If a vacuum cleaner is not available, a soft non-metallic bristle brush may be used. In either case, the tool should be applied in the direction of the fins. Coil surfaces can be easily damaged (fin edges can be easily bent over and damage to the coating of a protected coil) if the tool is applied across the fins.

NOTE: Use of a water stream, such as a garden hose, against a surface loaded coil will drive the fibers and dirt into the coil. This will make cleaning efforts more difficult. Surface loaded fibers must be completely removed prior to using low velocity clean water rinse.

Periodic Clean Water Rinse — A periodic clean water rinse is very beneficial for coils that are applied in coastal or industrial environments. However, it is very important that the water rinse is made with very low velocity water stream to avoid damaging the fin edges. Monthly cleaning as described below is recommended.

Routine Cleaning of Coil Surfaces — Monthly cleaning with Totaline® environmentally sound coil cleaner is essential to extend the life of coils. This cleaner is available from Carrier Replacement parts division as part number P902-0301 for a one gallon container, and part number P902-0305 for a 5 gallon container. It is recommended that all coils, including standard aluminum, pre-coated, copper/copper or E-coated coils be cleaned with the Totaline environmentally sound coil cleaner as described below. Coil cleaning should be part of the unit's regularly scheduled maintenance procedures to ensure long life of the coil. Failure to clean the coils may result in reduced durability in the environment.

Avoid the use of:

- coil brighteners
- acid cleaning prior to painting
- high pressure washers
- poor quality water for cleaning

Totaline environmentally sound coil cleaner is non-flammable, hypoallergenic, nonbacterial, and a USDA accepted biodegradable agent that will not harm the coil or surrounding components such as electrical wiring, painted metal surfaces, or insulation. Use of non-recommended coil cleaners is strongly discouraged since coil and unit durability could be affected.

Totaline Environmentally Sound Coil Cleaner Application Equipment

- 2 1/2 gallon garden sprayer
- water rinse with low velocity spray nozzle

⚠ CAUTION

Harsh chemicals, household bleach or acid or basic cleaners should not be used to clean outdoor or indoor coils of any kind. These cleaners can be very difficult to rinse out of the coil and can accelerate corrosion at the fin/tube interface where dissimilar materials are in contact. If there is dirt below the surface of the coil, use the Totaline environmentally sound coil cleaner as described above.

⚠ CAUTION

High velocity water from a pressure washer, garden hose, or compressed air should never be used to clean a coil. The force of the water or air jet will bend the fin edges and increase airside pressure drop. Reduced unit performance or nuisance unit shutdown may occur.

Totaline® Environmentally Sound Coil Cleaner Application Instructions

1. Proper eye protection such as safety glasses is recommended during mixing and application.
2. Remove all surface loaded fibers and dirt with a vacuum cleaner as described above.
3. Thoroughly wet finned surfaces with clean water and a low velocity garden hose, being careful not to bend fins.
4. Mix Totaline environmentally sound coil cleaner in a $2^1/_2$ gallon garden sprayer according to the instructions included with the cleaner. The optimum solution temperature is 100 F.

NOTE: Do NOT USE water in excess of 130 F, as the enzymatic activity will be destroyed.

5. Thoroughly apply Totaline environmentally sound coil cleaner solution to all coil surfaces including finned area, tube sheets and coil headers.
6. Hold garden sprayer nozzle close to finned areas and apply cleaner with a vertical, up-and-down motion. Avoid spraying in horizontal pattern to minimize potential for fin damage.
7. Ensure cleaner thoroughly penetrates deep into finned areas.
8. Interior and exterior finned areas must be thoroughly cleaned.
9. Finned surfaces should remain wet with cleaning solution for 10 minutes.
10. Ensure surfaces are not allowed to dry before rinsing. Reapplying cleaner as needed to ensure 10-minute saturation is achieved.
11. Thoroughly rinse all surfaces with low velocity clean water using downward rinsing motion of water spray nozzle. Protect fins from damage from the spray nozzle.

CONDENSATE DRAIN PAN — Check and clean each year at the start of the cooling season.

To clean the condensate pan:

1. Disconnect condensate drain system from side or bottom drain connection.
2. Remove and clean trap.
3. Remove 4 screws securing condensate pan access cover to unit. Save screws and panel.
4. Slide condensate pan out from unit and clean. Pan is made of non-corrosive plastic. Use a mild cleaner to remove heavy deposits of dirt and grime.
5. Replace pan in unit.
6. Replace condensate pan access cover with 4 screws saved from Step 3.
7. Re-attach and prime condensate trap.
8. Connect condensate drainage system.

NOTE: During winter in low (subfreezing) temperature regions, add antifreeze solutions to the drain. Protect against contact with children, pets and animals.

FILTERS — Clean or replace at start of each heating and cooling season, or more often if operating conditions require. Refer to Table 1 for type and size.

OUTDOOR-AIR INLET SCREENS — Clean screens with steam or hot water and a mild detergent.

Lubrication

COMPRESSORS — Each compressor is charged with the correct amount of oil at the factory.

⚠ CAUTION

The compressor is in a Puron® refrigerant system and uses a polyolester (POE) oil. This oil is extremely hygroscopic, meaning it absorbs water readily. POE oils can absorb 15 times as much water as other oils designed for HCFC and CFC refrigerants. Avoid exposure of the oil to the atmosphere. Damage to components could result.

Polyolester (POE) compressor lubricants are known to cause long term damage to some synthetic roofing materials. Exposure, even if immediately cleaned up, may cause roofing materials to become brittle (leading to cracking) within a year. When performing any service which may risk exposure of compressor oil to the roof, take appropriate precautions to protect roofing. Procedures which risk oil leakage include compressor replacement, repairing refrigerant leaks, and replacing refrigerant components. To prepare rooftop:

1. Cover extended roof work area with an impermeable plastic dropcloth or tarp. Make sure a 10 x 10 ft area around the work area is covered.
2. Cover area in front of the unit service panel with a terry cloth shop towel to absorb lubricant spills and prevent run-offs. Towel will also protect dropcloth from tears caused by tools or components.
3. Place terry cloth shop towel inside the unit directly under components to be serviced to prevent spills through the bottom of the unit.
4. Perform the required service.
5. Remove an dispose of any oil contaminated material per local codes.

INDOOR FAN SHAFT BEARINGS — The indoor fan has permanently sealed bearings. No field lubrication is necessary.

CONDENSER AND EVAPORATOR-FAN MOTOR BEARINGS — The condenser-fan and evaporator-fan motors have permanently sealed bearings, so no field lubrication is necessary.

Evaporator Fan Service and Replacement — The 50PG units feature a slide-out fan deck for easy servicing of the indoor-fan motor, pulleys, belt, and bearings. To service components in this section, perform the following procedure:

1. Turn off unit power.
2. Open the fan section access door.
3. Remove two no. 10 screws at front of slide-out fan deck. Save screws. See Fig. 22.
4. Disconnect the electrical wires connected to the slide-out fan deck (supply air thermistor and fan status switch if installed). Wires may be damaged if not disconnected.
5. Fan deck can now be slid out to access serviceable components.

⚠ CAUTION

DO NOT SLIDE FAN DECK OUT PAST THE FAN DECK STOP. If further access is required, the fan deck must be supported. Make sure plugs and wiring are not pinched between fan housing and unit sheet metal post. Damage to unit may result.

6. To replace fan deck to operating position, slide fan deck back into the unit. Secure with the two no. 10 screws removed in Step 3.

7. Re-attach electrical wires.
8. Close fan section access door.
9. Restore power to unit.

Evaporator Fan Performance Adjustment (Fig. 22 and 23) — Fan motor pulleys are factory set for speed shown in Table 17.

To change fan speeds:

1. Shut off unit power supply.
2. Loosen nuts on the 4 carriage bolts in the mounting base. Using adjusting bolts and plate, slide motor and remove belt.
3. Loosen movable-pulley flange setscrew (see Fig. 23).
4. Screw movable flange toward fixed flange to increase speed and away from fixed flange to decrease speed. Increasing fan speed increases load on motor. Do not exceed maximum speed specified in Table 17.

   See Table 15 for air quantity limits.
5. Set movable flange at nearest keyway of pulley hub and tighten setscrew. (See Table 17 for speed change for each full turn of pulley flange.)
6. Replace belts.
7. Realign fan and motor pulleys:
   a. Loosen fan pulley setscrews.
   b. Slide fan pulley along fan shaft.
   c. Make angular alignment by loosening motor from mounting plate.
8. Tighten belts.
9. Restore power to unit.

Evaporator Fan Belt Tension Adjustment — To adjust belt tension:

1. Turn off unit power.
2. Slide out fan deck to service position as shown in Evaporator Fan Service and Replacement section above.
3. Loosen motor mounting plate bolts.
4. Move motor mounting plate to adjust to proper belt tension. Motor adjuster bolts may be used to tighten belts. See Fig. 22. Do not overtighten belt.
5. Check for proper belt alignment. Adjust if necessary.
6. Tighten motor mounting plate bolts to lock motor in proper position.
7. Return fan deck back into operating position.
8. Restore power to unit.

Condenser-Fan Adjustment (Fig. 24)

1. Shut off unit power supply.
2. Remove condenser-fan assembly (grille, motor, motor cover, and fan) and loosen fan hub setscrews.
3. Adjust fan height as shown in Fig. 24.
4. Tighten setscrews and replace condenser-fan assembly.
5. Turn on power to unit.

Verify Sensor Performance — Using an ohmmeter and a thermometer, compare measured temperature to the resistance shown in Table 19.

Table 19 — Sensor Temperature/Resistance Values

TEMPERATURE (F)	RESISTANCE (ohms)
-58	200,250
-40	100,680
-22	53,010
-4	29,091
14	16,590
32	9,795
50	5,970
68	3,747
77	3,000
86	2,416
104	1,597
122	1,080
140	746
158	525
176	376
185	321
194	274
212	203
230	153
248	116
257	102
266	89
284	70
302	55

Economizer Operation During Power Failure — Dampers have a spring return. In event of power failure, dampers will return to fully closed position until power is restored. *Do not manually operate damper motor.*

Evacuation — Proper evacuation of the system will remove noncondensables and ensure a tight, dry system before charging. Evacuate from both high and low side ports. Never use the system compressor as a vacuum pump. Refrigerant tubes and indoor coil should be evacuated to 500 microns. Always break a vacuum with dry nitrogen. The two possible methods are the deep vacuum method and the triple evacuation method.

DEEP VACUUM METHOD — The deep vacuum method requires a vacuum pump capable of pulling a minimum vacuum of 500 microns and a vacuum gage capable of accurately measuring this vacuum depth. The deep vacuum method is the most positive way of assuring a system is free of air and liquid water. (See Fig. 25.)

TRIPLE EVACUATION METHOD — The triple evacuation method should only be used when vacuum pump is capable of pumping down to 28 in. of mercury and system does not contain any liquid water. Proceed as follows:

1. Pump system down to 28 in. of mercury and allow pump to continue operating for an additional 15 minutes.
2. Close service valves and shut off vacuum pump.
3. Connect a nitrogen cylinder and regulator to system and open until system pressure is 2 psig.
4. Close service valve and allow system to stand for 1 hr. During this time, dry nitrogen will be able to diffuse throughout the system, absorbing moisture.
5. Repeat this procedure. System will then contain minimal amounts of contaminants and water vapor.

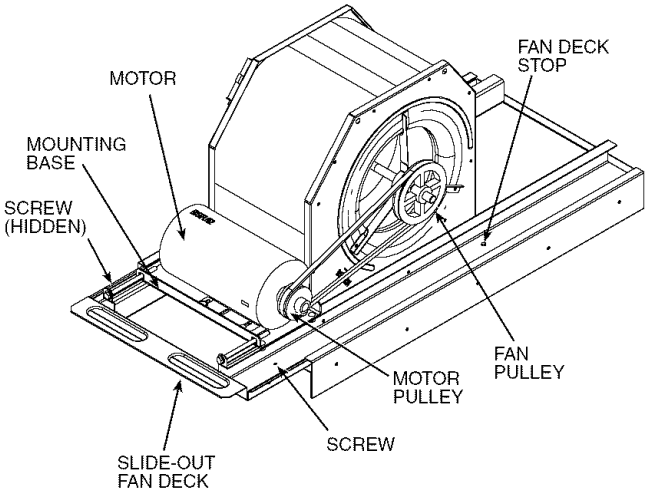


Fig. 22 — Evaporator-Fan Motor Adjustment

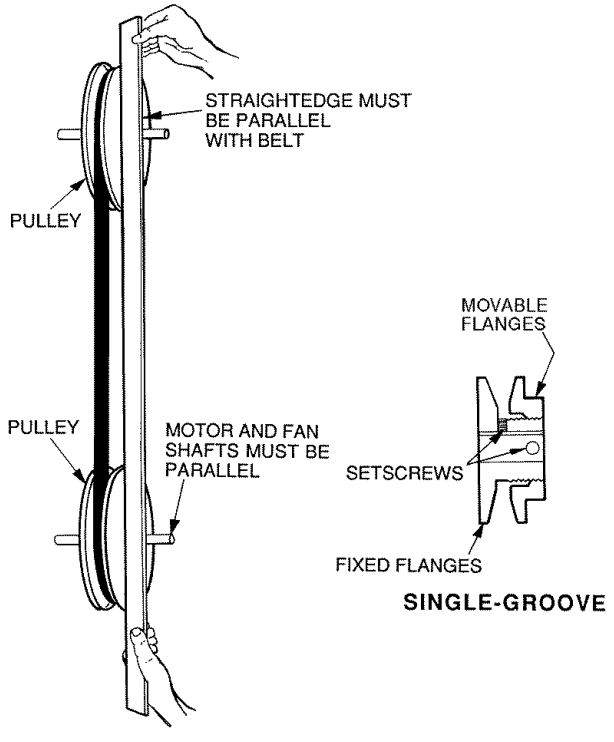


Fig. 23 — Evaporator-Fan Alignment and Adjustment

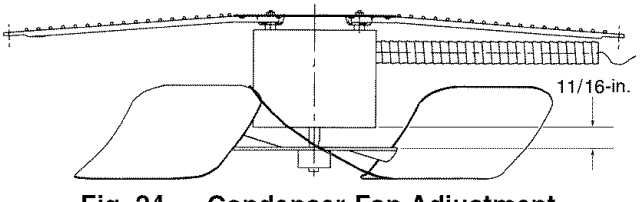


Fig. 24 — Condenser-Fan Adjustment

Refrigerant Charge — Amount of refrigerant charge is listed on unit nameplate. Refer to Carrier GTAC II; Module 5; Charging, Recovery, Recycling, and Reclamation section for charging methods and procedures. Unit panels must be in place when unit is operating during charging procedure.

Puron® (R-410A) refrigerant cylinders contain a dip tube which allows liquid refrigerant to flow from the cylinder in an upright position. Charge units with cylinder in the upright position and a commercial type metering device in the manifold hose.

⚠ CAUTION

This system uses Puron refrigerant which has higher pressures than R-22 and other refrigerants. No other refrigerant may be used in this system. Gage set, hoses, and recovery system must be designed to handle Puron refrigerant. If unsure about equipment, consult the equipment manufacturer.

NOTE: Do not use recycled refrigerant as it may contain contaminants.

NO CHARGE — Use standard evacuating techniques. After evacuating system, weigh in the specified amount of refrigerant (refer to unit nameplate).

LOW CHARGE COOLING — Using cooling charging chart (see Fig. 26-30), add or remove refrigerant until conditions of the chart are met. An accurate pressure gage and temperature-sensing device is required. Charging is accomplished by ensuring the proper amount of liquid subcooling. Connect pressure gage to the compressor discharge service valve. Connect temperature sensing device to the liquid line between the condenser and the TXV (thermostatic expansion valve) and insulate it so that ambient temperature does not affect reading.

TO USE THE COOLING CHARGING CHART — Use the above temperature and pressure readings, and find the intersection point on the cooling charging chart. If intersection point on chart is above line, add refrigerant. If intersection point on chart is below line, carefully recover some of the charge. Recheck suction pressure as charge is adjusted.

NOTE: Indoor-air cfm must be within normal operating range of unit. All outdoor fans must be operating.

The TXV is set to maintain between 10 and 15 degrees of superheat at the compressors. The valves are factory set and cannot be adjusted. Do not use a TXV designed for use with R-22 refrigerant.

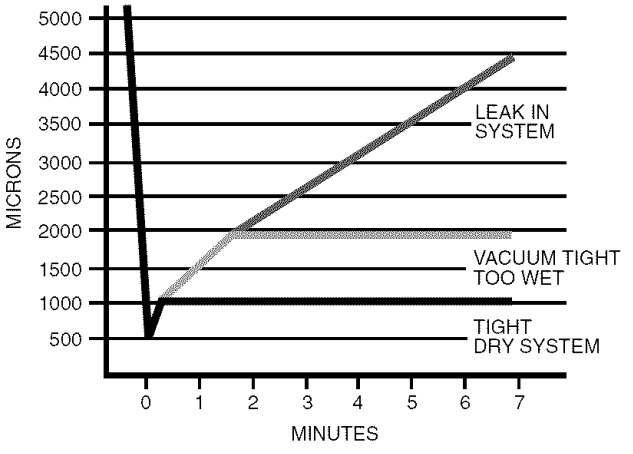


Fig. 25 — Deep Vacuum Graph

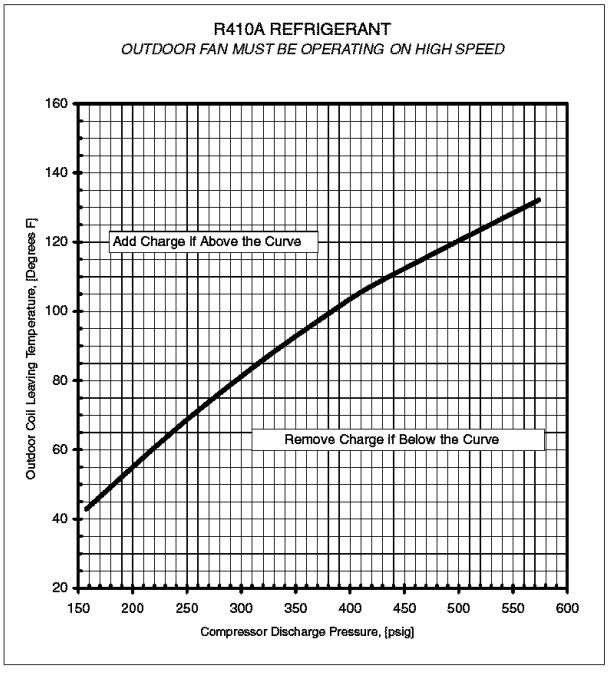


Fig. 26 — Charging Chart — 50PG03

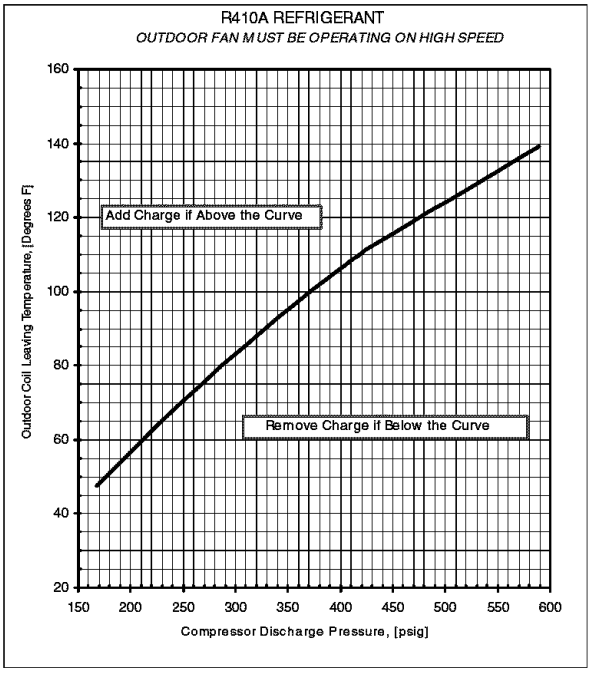


Fig. 28 — Charging Chart — 50PG05

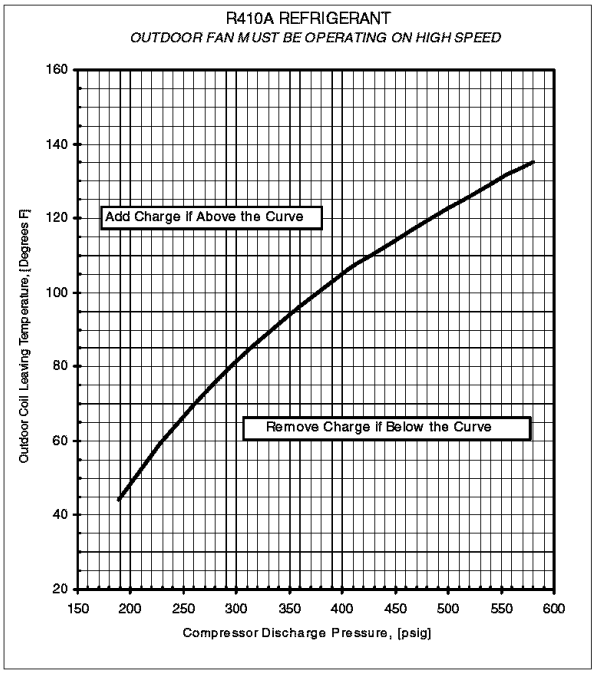


Fig. 27 — Charging Chart — 50PG04

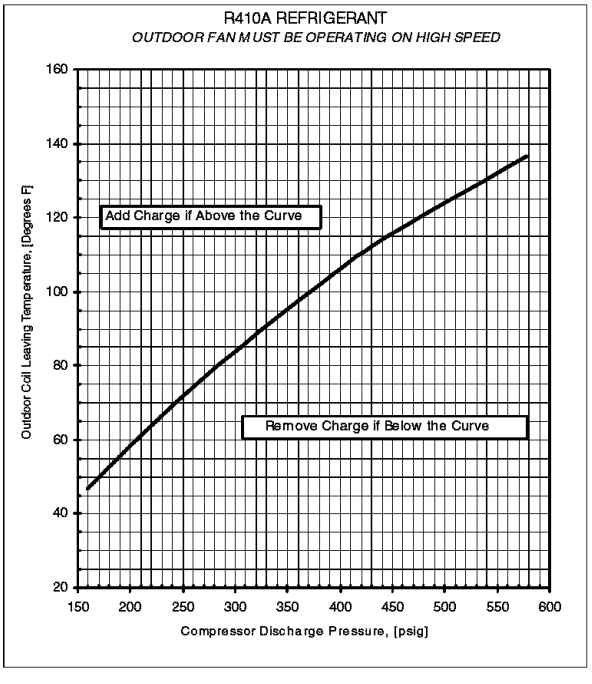


Fig. 29 — Charging Chart — 50PG06

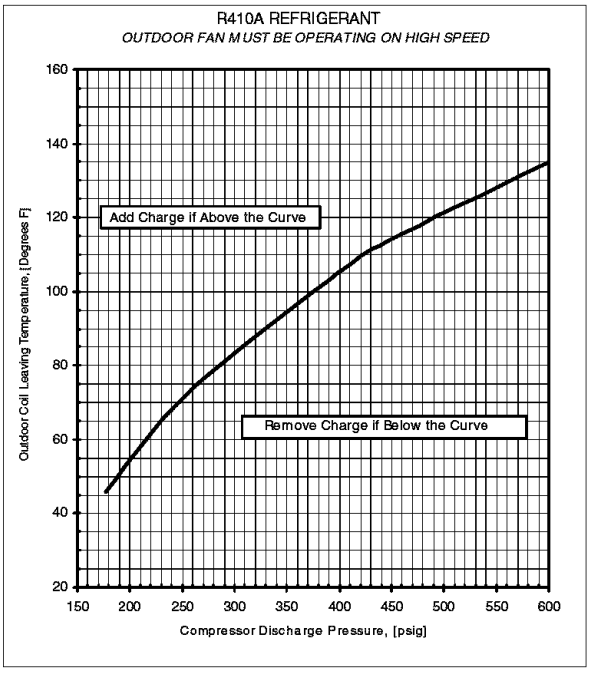


Fig. 30 — Charging Chart — 50PG07

PURON® REFRIGERANT — Puron refrigerant operates at 50 to 70 percent higher pressures than R-22. Be sure that servicing equipment and replacement components are designed to operate with Puron refrigerant. Do not mix with components that have been used with other refrigerants. Puron refrigerant, as with other HFCs, is only compatible with POE oils.

Recovery cylinder service pressure rating must be 400 psig. Puron systems should be charged with liquid refrigerant. Use a commercial-type metering device in the manifold hose. Manifold sets should be 750 psig high-side and 200 psig low-side with 520 psig low-side retard. Use hoses with 750 psig service pressure rating. Leak detectors should be designed to detect HFC refrigerant.

Filter Drier — Replace whenever refrigerant system is exposed to atmosphere. Only use factory specified liquid-line filter driers with working pressures no less than 650 psig. Do not install a suction-line filter drier in liquid line. A liquid-line filter drier designed for use with Puron refrigerant is required on every unit.

Protective Devices

COMPRESSOR PROTECTION

High-Pressure Switch — If the high-pressure switch opens, the compressor will shut down. On 3-phase units, the compressor lockout (CLO) device will energize to block further compressor operation. The high-pressure switch will reset automatically as the refrigerant pressure drops below its reset level. On 3-phase units, the CLO will remain energized until manually reset.

Low-Pressure Switch — If the low-pressure switch opens, the compressor will shut down. On 3-phase units, the compressor lockout (CLO) device will energize to block further compressor operation. The low-pressure switch will reset automatically as the refrigerant pressure rises above its reset level. On 3-phase units, the CLO will remain energized until manually reset.

Freeze Protection Switch — This switch is installed on each evaporator coil section to provide protection against continued unit operation with a frosted evaporator surface. If the freeze protection switch opens, the compressor on this circuit will shut down. On 3-phase units, tthe compressor lockout (CLO) device will energize to block further compressor operation. The freeze protection switch will reset as the evaporator tube temperature rises above its reset level. On 3-phase units, the CLO will remain energized until manually reset.

Compressor Lockout (CLO) Device (3-Phase Units Only) — The CLO prevents automatic recycling of the compressor as safety controls reset. If the high-pressure switch, low-pressure switch or freeze protection switch opens, the CLO device will energize to block further compressor operation. To reset the CLO (after all safety switches have reset), either open the thermostat to remove the cooling demand signal (and then re-close) or cycle the control power in the unit.

Overcurrent — Each compressor has internal line break motor protection.

Overtemperature — Each compressor has an internal protector to protect it against excessively high discharge gas temperatures.

EVAPORATOR FAN MOTOR PROTECTION — Indoor fan motors less than 5 hp are equipped with internal overcurrent and overtemperature protection. Protection devices reset automatically. Disconnect and lock out power when servicing motor. Indoor-fan motors 5 hp and larger are equipped with a manual reset, calibrated trip, magnetic circuit breaker and overcurrent protection. Do not bypass connections or increase the size of the breaker to correct trouble. Determine the cause and correct it before resetting the breaker.

CONDENSER-FAN MOTOR PROTECTION — Each condenser-fan motor is internally protected against overtemperature.

Relief Devices — All units have relief devices to protect against damage from excessive pressures (i.e., fire). These devices protect the high and low side and are located at the suction line service port. Protect joint during brazing operations near joint.

Control Circuit, 24-V — Each control circuit is protected against overcurrent by a 3.2 amp circuit breaker. Breaker can be reset. If it trips, determine cause of trouble before resetting. See Fig. 31 and 32.

Replacement Parts — A complete list of replacement parts may be obtained from any Carrier distributor upon request.

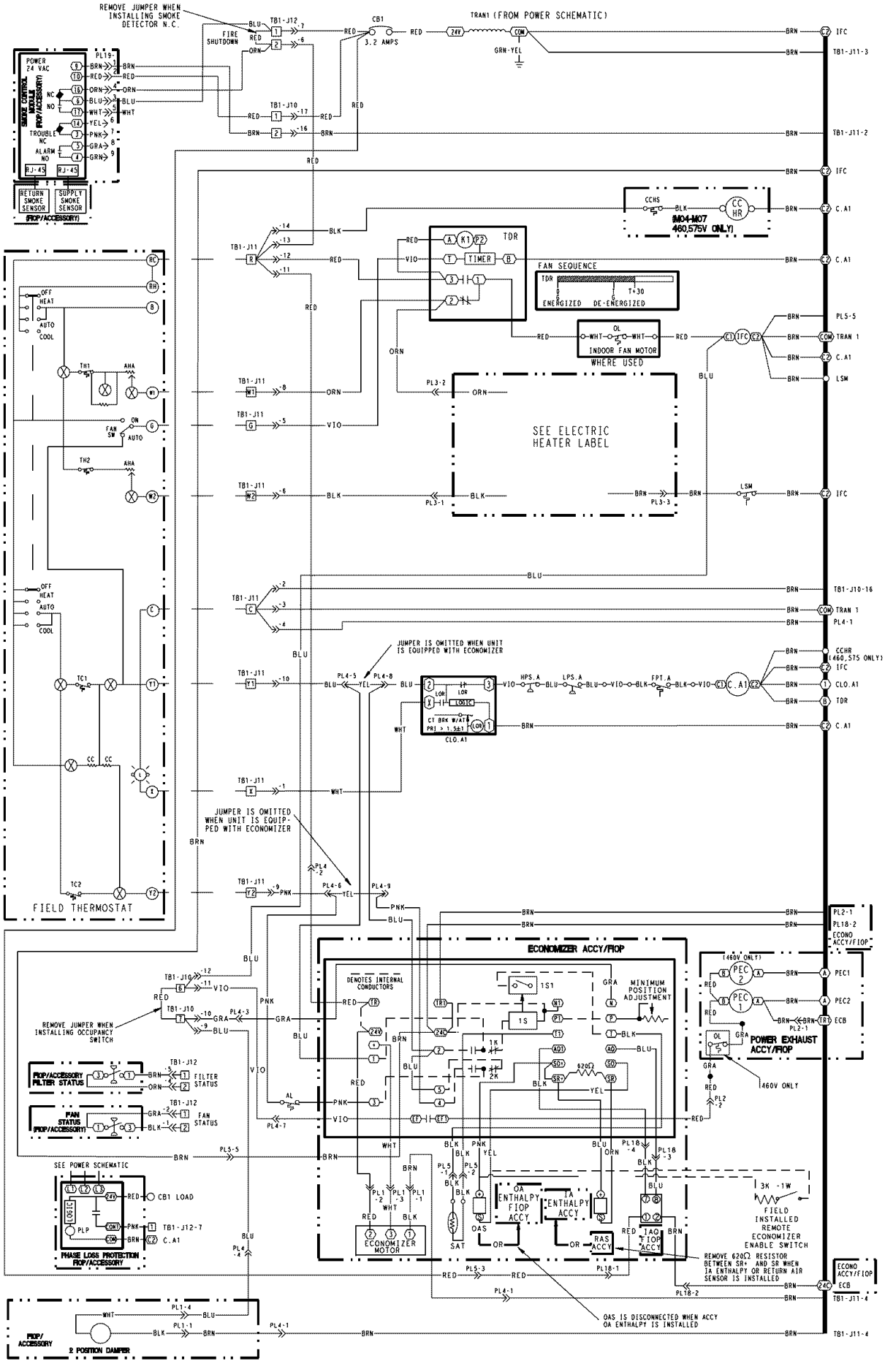
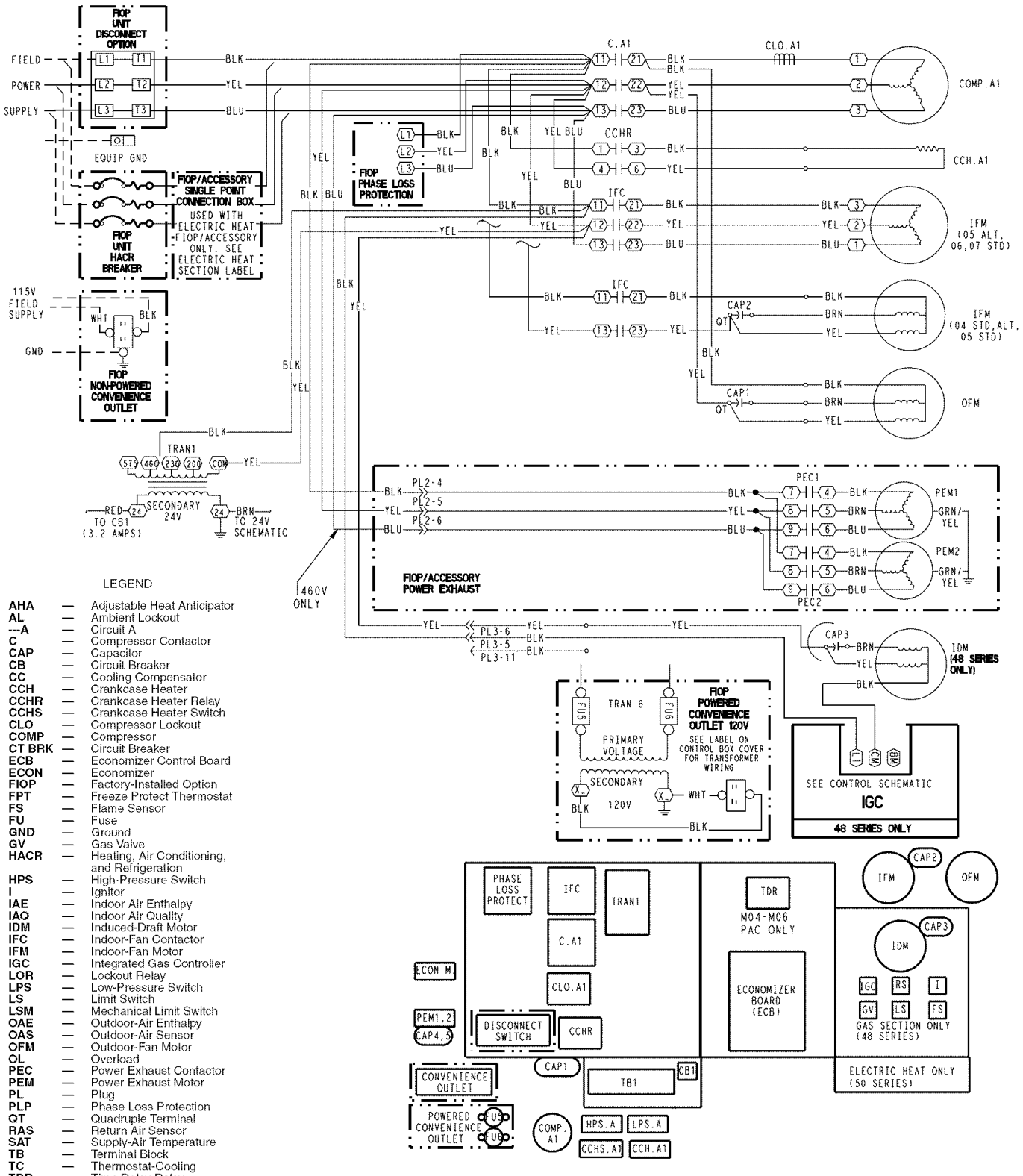


Fig. 31 — Typical Control Schematic



LEGEND

AHA	—	Adjustable Heat Anticipator
AL	—	Ambient Lockout
---A	—	Circuit A
C	—	Compressor Contactor
CAP	—	Capacitor
CB	—	Circuit Breaker
CC	—	Cooling Compensator
CCH	—	Crankcase Heater
CCHR	—	Crankcase Heater Relay
CCHS	—	Crankcase Heater Switch
CLO	—	Compressor Lockout
COMP	—	Compressor
CT BRK	—	Circuit Breaker
ECB	—	Economizer Control Board
ECON	—	Economizer
FIOP	—	Factory-Installed Option
FPT	—	Freeze Protect Thermostat
FS	—	Flame Sensor
FU	—	Fuse
GND	—	Ground
GV	—	Gas Valve
HACR	—	Heating, Air Conditioning, and Refrigeration
HPS	—	High-Pressure Switch
I	—	Ignitor
IAE	—	Indoor Air Enthalpy
IAQ	—	Indoor Air Quality
IDM	—	Induced-Draft Motor
IFC	—	Indoor-Fan Contactor
IFM	—	Indoor-Fan Motor
IGC	—	Integrated Gas Controller
LOR	—	Lockout Relay
LPS	—	Low-Pressure Switch
LS	—	Limit Switch
LSM	—	Mechanical Limit Switch
OAE	—	Outdoor-Air Enthalpy
OAS	—	Outdoor-Air Sensor
OFM	—	Outdoor-Fan Motor
OL	—	Overload
PEC	—	Power Exhaust Contactor
PEM	—	Power Exhaust Motor
PL	—	Plug
PLP	—	Phase Loss Protection
QT	—	Quadruple Terminal
RAS	—	Return Air Sensor
SAT	—	Supply-Air Temperature
TB	—	Terminal Block
TC	—	Thermostat-Cooling
TDR	—	Time Delay Relay
TH	—	Thermostat-Heating
TRAN	—	Transformer

Terminal (Marked)

Terminal (Unmarked)

Terminal Block

Factory Wiring

Field Control Wiring

Field Power Wiring

Accessory or Optional Wiring

To Indicate Common Potential Only. Not to Represent Wiring.

THERMOSTAT/IGC MARKINGS

BM	—	Blower Motor	L1	—	Line 1	W2	—	2nd Stage of Heating
C	—	Common	R	—	Thermostat Power	X	—	Alarm Output
CM	—	Combustion Motor	RT	—	Power Supply	Y1	—	1st Stage of Cooling
CS	—	Centrifugal Switch	SS	—	Speed Sensor	Y2	—	2nd Stage of Cooling
G	—	Fan	W	—	Thermostat Heat			
IFO	—	Indoor Fan On	W1	—	1st Stage of Heating			

NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with type 90° C or its equivalent.
2. Three phase motors are protected under primary single phasing conditions.
3. Use copper conductors only.
4. RED jumper wire must be added between R and W1 for Space Temperature mode and temporarily during Service Test mode when the heaters need to operate.
5. TRAN1 and 2 are wired for 230 v on 208/230 v units. If unit is to be run with 208 v power supply, disconnect BLK wire from 230 v terminal and connect to 200 v terminal.

Fig. 32 — Typical Power Schematic

TROUBLESHOOTING

Unit Troubleshooting — See Table 20 for unit cooling troubleshooting. See Table 21 for unit heating troubleshooting.

Table 20 — Cooling Service Analysis

PROBLEM	CAUSE	REMEDY
Compressor and Condenser Fan Will Not Start.	Power failure.	Call power company.
	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Defective thermostat, contactor, transformer, or control relay.	Replace component.
	Insufficient line voltage.	Determine cause and correct.
	Incorrect or faulty wiring.	Check wiring diagram and rewire correctly.
	Thermostat setting too high.	Lower thermostat setting below room temperature.
Compressor Will Not Start But Condenser Fan Runs.	Faulty wiring or loose connections in compressor circuit.	Check wiring and repair or replace.
	Compressor motor burned out, seized, or internal overload open.	Determine cause. Replace compressor.
	Defective run/start capacitor, overload, start relay.	Determine cause and replace.
	One leg of 3-phase power dead.	Replace fuse or reset circuit breaker. Determine cause.
Compressor Cycles (Other Than Normally Satisfying Thermostat).	Refrigerant overcharge or undercharge.	Recover refrigerant, evacuate system, and recharge to nameplate.
	Defective compressor.	Replace and determine cause.
	Insufficient line voltage.	Determine cause and correct.
	Blocked condenser.	Determine cause and correct.
	Defective run/start capacitor, overload, or start relay.	Determine cause and replace.
	Defective thermostat.	Replace thermostat.
	Faulty condenser-fan motor or capacitor.	Replace.
	Restriction in refrigerant system.	Locate restriction and remove.
Compressor Operates Continuously.	Dirty air filter.	Replace filter.
	Unit undersized for load.	Decrease load or increase unit size.
	Thermostat set too low.	Reset thermostat.
	Low refrigerant charge.	Locate leak, repair, and recharge.
	Leaking valves in compressor.	Replace compressor.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condenser coil dirty or restricted.	Clean coil or remove restriction.
Excessive Head Pressure.	Dirty air filter.	Replace filter.
	Dirty condenser coil.	Clean coil.
	Refrigerant overcharged.	Recover excess refrigerant.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condenser air restricted or air short-cycling.	Determine cause and correct.
Head Pressure Too Low.	Low refrigerant charge.	Check for leaks, repair, and recharge.
	Compressor valves leaking.	Replace compressor.
	Restriction in liquid tube.	Remove restriction.
Excessive Suction Pressure.	High heat load.	Check for source and eliminate.
	Compressor valves leaking.	Replace compressor.
	Refrigerant overcharged.	Recover excess refrigerant.
Suction Pressure Too Low.	Dirty air filter.	Replace filter.
	Low refrigerant charge.	Check for leaks, repair, and recharge.
	Metering device or low side restricted.	Remove source of restriction.
	Insufficient evaporator airflow.	Increase air quantity. Check filter and replace if necessary.
	Temperature too low in conditioned area.	Reset thermostat.
	Outdoor ambient below 25 F.	Install low-ambient kit.
Evaporator Fan Will Not Shut Off.	Time off delay not finished.	Wait for 30-second off delay.

Table 21 — Heating Service Analysis

PROBLEM	CAUSE	REMEDY
No Heat.	Power failure.	Call power company.
	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Thermostat not calling for heating.	Check thermostat.
	No 24 vac at primary contactor.	Check transformer and circuit breaker.
	No power (high voltage) to L2 of primary contactor.	Check safety switches, one shot backup, and auto limit.
	Bad electrical elements.	With power off, remove high voltage wires and check resistance of heater. Replace if open.

EconoMi$er IV Troubleshooting

ECONOMI$ER IV PREPARATION — This procedure is used to prepare the EconoMi$er IV for troubleshooting. No troubleshooting or testing is done by performing the following procedure.

NOTE: This procedure requires a 9-v battery, 1.2 kilo-ohm resistor, and a 5.6 kilo-ohm resistor which are not supplied with the EconoMi$er IV.

IMPORTANT: Be sure to record the positions of all potentiometers before starting troubleshooting.

1. Disconnect power at TR and TR1. All LEDs should be off. Exhaust fan contacts should be open.
2. Disconnect device at P and P1.
3. Jumper P to P1.
4. Disconnect wires at T and T1. Place 5.6 kilo-ohm resistor across T and T1.
5. Jumper TR to 1.
6. Jumper TR to N.
7. If connected, remove sensor from terminals S_O and +. Connect 1.2 kilo-ohm 4074EJM checkout resistor across terminals S_O and +.
8. Put 620-ohm resistor across terminals S_R and +.
9. Set minimum position, DCV set point, and exhaust potentiometers fully CCW (counterclockwise).
10. Set DCV maximum position potentiometer fully CW (clockwise).
11. Set enthalpy potentiometer to D.
12. Apply power (24 vac) to terminals TR and TR1.

DIFFERENTIAL ENTHALPY — To check differential enthalpy:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Place 620-ohm resistor across S_O and +.
3. Place 1.2 kilo-ohm resistor across S_R and +. The Free Cool LED should be lit.
4. Remove 620-ohm resistor across S_O and +. The Free Cool LED should turn off.
5. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

SINGLE ENTHALPY — To check single enthalpy:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Set the enthalpy potentiometer to A (fully CCW). The Free Cool LED should be lit.
3. Set the enthalpy potentiometer to D (fully CW). The Free Cool LED should turn off.
4. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

DCV (Demand Controlled Ventilation) AND POWER EXHAUST — To check DCV and Power Exhaust:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Ensure terminals AQ and AQ1 are open. The LED for both DCV and Exhaust should be off. The actuator should be fully closed.
3. Connect a 9-v battery to AQ (positive node) and AQ1 (negative node). The LED for both DCV and Exhaust should turn on. The actuator should drive to between 90 and 95% open.
4. Turn the Exhaust potentiometer CW until the Exhaust LED turns off. The LED should turn off when the potentiometer is approximately 90%. The actuator should remain in position.
5. Turn the DCV set point potentiometer CW until the DCV LED turns off. The DCV LED should turn off when the potentiometer is approximately 9V. The actuator should drive fully closed.
6. Turn the DCV and Exhaust potentiometers CCW until the Exhaust LED turns on. The exhaust contacts will close 30 to 120 seconds after the Exhaust LED turns on.
7. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

DCV MINIMUM AND MAXIMUM POSITION — To check the DCV minimum and maximum position:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Connect a 9-v battery to AQ (positive node) and AQ1 (negative node). The DCV LED should turn on. The actuator should drive to between 90 and 95% open.
3. Turn the DCV Maximum Position potentiometer to midpoint. The actuator should drive to between 20 and 80% open.
4. Turn the DCV Maximum Position potentiometer to fully CCW. The actuator should drive fully closed.
5. Turn the Minimum Position potentiometer to midpoint. The actuator should drive to between 20 and 80% open.
6. Turn the Minimum Position Potentiometer fully CW. The actuator should drive fully open.
7. Remove the jumper from TR and N. The actuator should drive fully closed.
8. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

MIXED AIR INPUT — To check mixed air input:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Set the Enthalpy potentiometer to A. The Free Cool LED turns on. The actuator should drive to between 20 and 80% open.
3. Remove the 5.6 kilo-ohm resistor and jumper T to T1. The actuator should drive fully open.

4. Remove the jumper across T and T1. The actuator should drive fully closed.
5. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

ECONOMI$ER IV TROUBLESHOOTING COMPLETION — This procedure is used to return the EconoMi$er IV to operation. No troubleshooting or testing is done by performing the following procedure.

1. Disconnect power at TR and TR1.
2. Set enthalpy potentiometer to previous setting.
3. Set DCV maximum position potentiometer to previous setting.
4. Set minimum position, DCV set point, and exhaust potentiometers to previous settings.
5. Remove 620-ohm resistor from terminals S_R and +.
6. Remove 1.2 kilo-ohm checkout resistor from terminals S_O and +. If used, reconnect sensor from terminals S_O and +.
7. Remove jumper from TR to N.
8. Remove jumper from TR to 1.
9. Remove 5.6 kilo-ohm resistor from T and T1. Reconnect wires at T and T1.
10. Remove jumper from P to P1. Reconnect device at P and P1.
11. Apply power (24 vac) to terminals TR and TR1.

Phase Loss Protection — The phase loss protection option will monitor the three-phase electrical system to provide phase reversal and phase loss protection.

PHASE REVERSAL PROTECTION — If the control senses an incorrect phase relationship, the relay (K1) will be de-energized (opening its contact). If the phase relationship is correct, the relay will be energized. The control has a self-bypass function after a pre-set time. If the control determines that the three phases stay in a correct relationship for 10 consecutive minutes, the relay will stay energized regardless of the phase sequence of three inputs as long as 24-vac control voltage is applied. This self-bypass function will be reset if all three phases are restored in a phase loss event.

PHASE LOSS PROTECTION — If the reverse rotation board senses any one of the three phase inputs has no AC voltage, the relay will be deenergized (opening its contact). This protection is always active as long as 24-vac control voltage is applied, and is not affected by the self bypass function of the phase sequence monitoring function. However, in the event of phase loss, the relay will be re-energized only if all three phases are restored and the three phases are in the correct sequence.

A red LED is provided to indicate the function of the board. See the table below.

LED STATUS	FUNCTION
On Continuously	Relay contact closed (normal operation).
Blinking	Relay contact open (phase loss or phase reversal has occurred) — No power will be supplied to the control system.
Off	24 vac control power not present (off).

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UNIT START-UP CHECKLIST

MODEL NO.:_____ SERIAL NO.:_____

DATE:_____ TECHNICIAN: _____

I. PRE-START-UP:

- ☐ VERIFY THAT ALL PACKING MATERIALS HAVE BEEN REMOVED FROM UNIT
- ☐ VERIFY INSTALLATION OF OUTDOOR AIR HOOD
- ☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTRUCTIONS
- ☐ VERIFY THAT ALL ELECTRICAL CONNECTIONS AND TERMINALS ARE TIGHT
- ☐ CHECK THAT INDOOR-AIR FILTERS ARE CLEAN AND IN PLACE
- ☐ CHECK THAT OUTDOOR AIR INLET SCREENS ARE IN PLACE
- ☐ VERIFY THAT UNIT IS LEVEL
- ☐ CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE, AND VERIFY SETSCREW IS TIGHT
- ☐ VERIFY THAT FAN SHEAVES ARE ALIGNED AND BELTS ARE PROPERLY TENSIONED
- ☐ VERIFY THAT SCROLL COMPRESSORS ARE ROTATING IN THE CORRECT DIRECTION
- ☐ VERIFY INSTALLATION OF THERMOSTAT
- ☐ VERIFY THAT CRANKCASE HEATERS HAVE BEEN ENERGIZED FOR AT LEAST 24 HOURS

II. START-UP

ELECTRICAL

SUPPLY VOLTAGE L1-L2 _____ L2-L3 _____ L3-L1 _____

COMPRESSOR AMPS — COMPRESSOR A1		L1	_____	L2	_____	L3 _____
ELECTRIC HEAT AMPS (IF EQUIPPED)		L1	_____	L2	_____	L3 _____
SUPPLY FAN AMPS	_____	L1	_____	L2	_____	L3 _____

TEMPERATURES

OUTDOOR-AIR TEMPERATURE _____ F DB (Dry Bulb)

RETURN-AIR TEMPERATURE _____ F DB _____ F WB (Wet Bulb)

COOLING SUPPLY AIR _____ F

ELECTRIC HEAT SUPPLY AIR _____ F

PRESSURES

REFRIGERANT SUCTION CIRCUIT A _____ PSIG

REFRIGERANT DISCHARGE CIRCUIT A _____ PSIG

☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS ON PAGES 41 AND 42

GENERAL

☐ ECONOMIZER MINIMUM VENT AND CHANGEOVER SETTINGS TO JOB REQUIREMENTS

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

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